

University of Alberta
Department of Mathematical and Statistical
Sciences

Math 225 Section Q1, Linear Algebra II
Winter 2013

Instructor: Paul Buckingham
Office: CAB 489
Email: p.r.buckingham@ualberta.ca
Office hours: See course webpage
Lecture room and time: Lecture Q1 MWF, 12:00–12:50, DP 1030
Course webpage: <http://www.math.ualberta.ca/~pbuckingham/225/>

Course description:

Complex numbers; vector spaces; inner product spaces; examples of n -space and the space of continuous functions; Gram–Schmidt process, QR factorization of a matrix and least squares; linear transformations, change of basis, similarity and diagonalization; orthogonal diagonalization, quadratic forms; applications and numerical methods. Prerequisites: A 100-level linear algebra course, and one of Mathematics 31 or a 100-level calculus course. Note: This course cannot be taken for credit if credit has already been obtained in MATH 227.

Course objectives and expected learning outcomes:

- To understand linear algebra on a more abstract level than in MATH 125 through the study of abstract vector spaces
- To obtain a deeper understanding of concepts introduced in MATH 125 such as diagonalization and inner products
- To learn applications of the theory to practical settings such as least-square problems and decoupling simultaneous differential equations

Required textbook:

The course is based on the fourth edition of David C. Lay's *Linear Algebra and Its Applications*. You may obtain either a physical copy of the book or access to the online version of the book. If online access is your preference, please visit the University Bookstore to find out how to obtain it.

The sections to be covered in the course can be found in the table below. Sections appearing in parentheses, e.g., (5.1–5.3), indicate material from MATH 125 that will be reviewed. The review topics may be presented in less detail than they were originally taught in MATH 125. Students are highly recommended to review MATH 125 in their own time as well.

Chapter	Sections
4	4.1–4.9
5	(5.1–5.3), 5.4–5.7
6	(6.1–6.3), 6.4–6.8
7	7.1, 7.2

Course evaluation:

Assignments	25%	8 assignments, spread throughout the course
Midterm	25%	Monday, February 25 th , in class
Final exam	50%	Thursday, April 25 th , 14:00–17:00

Note: The date of the final examination is set by the Registrar and takes precedence over the final examination date reported in this document. Students must verify this date on Bear Tracks when the Final Exam Schedule is posted. The venue for the final examination will appear on Bear Tracks.

Grading:

Percentage scores will be converted to the university grading system according to the chart below. Grades may be adjusted to account for exceptional grade distributions.

Course mark	Letter grade
95–100	A+
90–94	A
85–89	A–
80–84	B+
75–79	B
70–74	B–
65–69	C+
60–64	C
55–59	C–
52–54	D+
50–51	D
0–49	F

Sample exams:

Samples of midterm and final exams will be provided on eClass.

Assignments:

There will be eight assignments. The due date for each assignment will be announced when the assignment is set.

Exams:

No electronic equipment may be brought in to the examination rooms. This includes calculators and cell phones. Your student photo I.D. is required at exams to verify your identity. Students will not be allowed to begin an examination after it has been in progress for 30 minutes. Students must remain in the exam room until at least 30 minutes have elapsed.

Missed midterm:

A student who cannot write a midterm due to incapacitating illness, severe domestic affliction or other compelling reasons can **apply** for an excused absence. To apply for an excused absence, the student **must present supporting documentation** pertaining to the absence to the instructor within two working days following the scheduled date of the missed term work, or as soon as the student is able. In the case of an incapacitating illness, either a medical note or a statutory declaration (which can be obtained at the student's Faculty Office) will be accepted. The weight of the missed exam will be transferred to the final exam.

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*.

Missed final examination:

A student who cannot write the final examination due to incapacitating illness, severe domestic affliction or other compelling reasons can **apply** for a deferred final examination. Such an application must be made to the student's Faculty office within 48 hours of the missed examination and must be supported by a Statutory Declaration (in lieu of a medical statement form) or other appropriate documentation (Calendar section 23.5.6). Deferred examinations are a privilege and not a right; there is no guarantee that a deferred examination will be granted. Misrepresentation of Facts to gain a deferred examination is a serious breach of the *Code of Student Behaviour*.

All deferred final examinations will be scheduled as follows:

Date: Saturday, May 4th
Time: 09:00 (students must arrive by 08:30 to register)
Location: CAB 357

Re-examination:

A student who writes the final examination and fails the course may **apply** for a re-examination. Re-examinations are rarely granted in the Faculty of Science. These exams are governed by University (Calendar section 23.5.5) and Faculty of Science Regulations (Calendar section 192.5.9). Misrepresentation of Facts to gain a re-examination is a serious breach of the *Code of Student Behaviour*.

Student responsibilities

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 provisions of the *Code of Student Behaviour* (online at www.governance.ualberta.ca) and avoid any behaviour which 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 dishonesty are unacceptable at the University. Any offense will be reported to the Senior Associate Dean of Science who will determine the disciplinary action to be taken. Cheating, plagiarism and misrepresentation of facts are serious offenses. The **minimum sanction** for anyone who engages in these practices is a grade of zero for the exam or paper in question, and no opportunity will be given to replace the grade or redistribute the weights. As well, in the Faculty of Science the sanction for **cheating** on any examination will include a **disciplinary failing grade** (no exceptions) and senior students should expect a period of suspension or expulsion from the University of Alberta.

Cell phones:

Cell phones are to be turned off during lectures, labs and seminars. Cell phones are not to be brought to exams.

Audio and 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 a 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 prior written consent from the instructor.

Students with disabilities:

Students who require accommodation in this course due to a disability are advised to discuss their needs with Specialized Support and Disability Services (2-800 Students' Union Building).

Academic Support Centre:

Students who require additional help in developing strategies for better time management, study skills or examination skills should contact the Academic Support Centre (2-300 Students' Union Building).

Decima Robinson Support Centre for Mathematical and Statistical Sciences:

Students who require additional help with assignments or have questions about the course material in general are encouraged to visit the Decima Robinson Support Centre (528 Central Academic Building). Graduate students will be available to provide one-on-one help. In order to get maximum help during each visit, students are asked to be specific about the problem with which they are

seeking help. The Centre is open Monday to Friday, 09:00–15:00.

Disclaimer:

Any typographical errors in this course outline are subject to change and will be announced in class.