

**Department of Mathematics**  
**MATH 1300 Vector Geometry and Linear Algebra**

**September - December 2018**

**Prerequisite:** a minimum grade of 60% in Pre-calculus Mathematics 40S or the former Mathematics 40S (300), or a grade of "C" or better in the MSKL 100 offered by Extended Education. NOTE: A minimum grade of 70% in Applied Mathematics 40S may be used as a prerequisite to this course.

**Textbook:** Selected Chapters from Elementary Linear Algebra (11<sup>th</sup> Edition) by Howard Anton

**COURSE OUTLINE:**

Systems of linear equations and matrices: Gaussian elimination, matrix operations, inverses, elementary matrices, and classes of matrices. **(Sections 1.1 – 1.7 in Anton)**

Determinants: co-factor expansion, evaluating by row reduction, properties, Cramer's rule. **(Sections 2.1 – 2.3 in Anton)**

Vectors and geometry in the plane  $\mathbb{R}^2$  and in the space  $\mathbb{R}^3$ , norm of a vector, vector operations, dot product, projections, cross product, lines and planes in  $\mathbb{R}^3$  **(Sections 3.1 – 3.5 in Anton)**

General linear transformations, matrices as linear transformations, rotations, reflections, dilations **(Sections 1.8. and 4.9 in Anton)**

Eigenvalues and eigenvectors, similar matrices and diagonalization **(Sections 5.1 and 5.2 in Anton)**

**CLASSES AND TUTORIALS:**

You must register in and attend one of the tutorial sections associated with your lecture. There are three things you must do to succeed in this course:

- Attend lectures, where theory will be explained and examples calculated.
- Attend your tutorial, where a teaching assistant will present additional examples.
- Study the text and do *at least* the suggested homework questions.

The **tutorials** (labs) begin the week of September 10, 2018, on the day according to your lab section schedule. Five short quizzes will be given in the tutorial.

The **Mathematics Help Centre** is located in 412 Machray Hall, and it is a place where you can get help with the material and the exercises related to the course. It opens September 10, 2018.

No classes or labs during **Term Break** November 13 to 16, 2018.

**EXERCISES:** In order to learn the material of the course you will have to do a great deal of practice. Every student should work through the assigned problems in the exercises.

**EVALUATION:** There will be a two-hour final exam during the regular exam period in **December**. Your final grade will be based on 10% tutorial tests (best of 4 out of 5, **no deferrals allowed for any reason**), 30% midterm, and 60% final. The tutorial tests dates will be available from your section's instructors.

**Midterm test:** There will be a one-hour midterm test, which will be held on **Tuesday, October 23, 2018, 5:45-6:45 p.m.**, in multiple rooms to be announced in class later in the term. No make-ups or deferrals are permitted except for reasons the University normally finds acceptable for absence from a final exam.

**Notes, books, calculators or other computing devices are not permitted for any of the quizzes, tests or exams.**

The **Voluntary Withdrawal** deadline is November 19, 2018.

**Grading:** The following is the grading table which may be adjusted downwards:

Letter grade	Minimum percentage to guarantee	Grade Point
A +	95	4.5
A	86	4.0
B +	80	3.5
B	72	3.0
C +	65	2.5
C	60	2.0
D	50	1.0

**Recording class lectures:** The instructor and the University of Manitoba hold copyright over the course materials, presentations and lectures that form part of this course. No audio or video recording of lectures or presentations is allowed in any format, openly or surreptitiously, in whole or in part without permission. Course materials (both paper and digital) are for the participant's private study and research.

**Student Accessibility Services:** If you are a student with a disability, please contact SAS for academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations. Students who have, or think they may have, a disability (e.g. mental illness, learning, medical, hearing, injury-related, visual) are invited to contact SAS to arrange a confidential consultation.

Student Accessibility Services

<http://umanitoba.ca/student/saa/accessibility>

520 University Centre

204 474 7423

[Student\\_accessibility@umanitoba.ca](mailto:Student_accessibility@umanitoba.ca)

### **Academic Integrity:**

The Department of Mathematics, the Faculty of Science and the University of Manitoba regard acts of academic dishonesty in quizzes, tests, examinations or assignments as serious offences and may assess a variety of penalties depending on the nature of the offence.

Acts of academic dishonesty include bringing unauthorized materials into a test or exam, copying from another student, plagiarism and examination personation. Students are advised to read section 7 (Academic Integrity) and section 4.2.8 (Examinations: Personations) in the "General Academic Regulations and Requirements" of the current Undergraduate Calendar.

***Note, in particular that cell phones and pagers are explicitly listed as unauthorized materials, and hence may not be present during tests or examinations.***

Penalties for violation include being assigned a grade of zero on a test or assignment, being assigned a grade of "F" in a course, compulsory withdrawal from a course or program, suspension from a course/program/faculty or even expulsion from the University. For specific details about the nature of penalties that may be assessed upon conviction of an act of academic dishonesty, students are referred to University Policy 1202 (*Student Discipline Bylaw*) and to the Department of Mathematics policy concerning minimum penalties for acts of academic dishonesty.

The *Student Discipline Bylaw* is printed in its entirety in the Student Guide, and is also available on-line or through the Office of the University Secretary. Minimum penalties assessed by the Department of Mathematics for acts of academic dishonesty are available on the Department of Mathematics web-page.

All Faculty members (and their teaching assistants) have been instructed to be vigilant and report incidents of academic dishonesty to the Head of the Department.