



MATH 204: Vectors & Matrices (Summer 2026)

Instructor: _____

Email Address: _____

Lectures: _____

Office Hours: Your professor will announce their office hours during which they will also be available to give a reasonable amount of help. Note, however, that if you missed a class, it is not reasonable to expect your professor to cover the missed material for you.

Important: Students should get the above information from their instructor and from the course Moodle site. The instructor is the person to contact should there be any questions about the course.

Prerequisite: MATH 201 or equivalent.

Course Website: Moodle

Textbook

Elementary Linear Algebra, Custom Version, 12th Edition, by H. Anton, C. Rorres & A. Kaul (John Wiley & Sons).

The hard-copy text can be purchased at the Concordia bookstore, <https://www.bkstr.com/concordiastore/home>.

Note: Students should order textbooks as early as possible, especially for printed versions in case books are backordered or there are any shipping delays.

Tutorials

The material on this course requires a lot of practice and a strong background in arithmetic and algebra. The Department has therefore organized special tutorial sessions to review required topics in arithmetic and algebra and to practice the course material. The tutorials are conducted every week to provide additional support to students. Students are strongly encouraged to participate and be active in these problem-solving sessions. Tutorials are an important resource to help students succeed in this course. You will find on the Moodle site all the information regarding location and dates for these tutorials.

Math Help Centre

A Math Help Centre staffed by graduate students is available. It is a drop-in service, and you can ask questions regarding the course material and background mathematics. The schedule of its operation will be posted in the Department and on the Department webpage <https://www.concordia.ca/artsci/math-stats/services.html#academic-support>

WeBWorK

Every student will be given access to an online system called **WeBWorK**. The system provides you with many exercises and practice problems. Students will use this system to do online assignments (see **Assignments** below). In addition, before the midterm test and before the final exam, a number of practice problems will be posted in **WeBWorK** to help you review the material for the course.

Assignments

Students are expected to submit assignments online using **WeBWorK**. Late assignments **will not** be accepted. Assignments contribute 10% to your final grade. Working regularly on the assignments is essential for success in this course. Students are also strongly encouraged to do as many problems as their time permits from the list of recommended problems included in this outline, as well as practice problems. A solutions manual for all odd-numbered questions is packaged with the textbook.

Calculators

Only calculators approved by the Department (with a sticker attached as proof of approval) are permitted for the class test and final examination. For a list of Approved calculators see:

<https://www.concordia.ca/artsci/math-stats/services/advising/calculators.html>

Midterm Test

There will be one **midterm test** in Class #7. The test will be 90 minutes long and will be based on the material of all previous classes (Lectures 1-6). The midterm text contributes up to 30% of your final grade (**see the Grading Scheme below**). **The midterm test will be held during lecture time.**

There is no make-up or alternate midterm test. For students who are unable to write the midterm test (for ANY reason), the final exam weight will be elevated automatically to 90% (as per the Grading Scheme below). It is strongly recommended, however, that students prepare themselves for, and do take the midterm test because:

- The midterm test may contribute 30% to your grade, so it may help elevate the grade received in the course; and
- The midterm test is an important opportunity to get timely feedback on your progress in the course.

Final Exam

The final examination will be three hours long and will cover all the material in the course.

PLEASE NOTE: Students are responsible for finding out the date and time of the final exam once the schedule is posted by the Examinations Office. Any conflicts or problems with the scheduling of the final exam must be reported directly to the Examinations Office, **not** to your instructor. It is the Department's policy and the Examination Office's policy **that students are to be available until the end of the final exam period. Conflicts due to travel plans will not be accommodated.**

Grading Scheme

The final grade will be based, in all cases, on the *higher* of the two options:

- (a) 10% for the assignments, 30% for the midterm test, 60% for the final exam.
- (b) 10% for the assignments, 90% for the final exam.

IMPORTANT: PLEASE NOTE THAT THERE IS NO "100% FINAL EXAM" OPTION IN THIS COURSE.

The following schedule of topics is approximative.

Class #	Sections	Topics	Recommended problems
1	1.1 1.2	Systems of Linear Equations Gaussian Elimination	1.1: 12, 15b, 20, 21 1.2: 3, 6, 8, 17, 18, 22, 23, 25, 26, 28, 33, 37
2	1.3 1.4	Matrices and Matrix Operations Inverses; Algebraic Properties of Matrices	1.3: 3fj,6de,7d 1.4: 1b, 2c, 17, 22, 29
3	1.5 1.6	Elementary Matrices; Method to find A^{-1} Linear Systems and Invertible Matrices	1.5: 4cd, 15, 17 1.6: 5, 12, 16, 19 Chapter 1 Supplementary Exercises: 9, 10, 11, 13 a, b, c
4	2.1 2.2	Determinants by Cofactor Expansion Evaluating Determinants by Row Reduction	2.1: 3c, 25 2.2: 11
5	2.3 3.1	Properties of Determinants, Cramer's Rule Vectors in 2-space, 3-space	2.3: 22, 27, 34, 35 Chapter 2 Supplementary Exercises: 15, 31, 32 3.1: 10d, 20, 21, 27
6	3.2 3.3	Norm, Dot Product, Distance in R^2 , R^3 Orthogonality	3.2: 9, 11a 3.3: 4, 8, 13, 21, 25, 27
7	MIDTERM TEST (includes the material of the Lectures 1-6)		
7	3.4	Geometry of Linear Systems	3.4: 4, 10, 13, 16
8	3.5 4.1	Cross Product Real Vector Spaces	3.5: 7, 16, 18 Chapter 3 Supplementary Exercises: 1abcdef, 4, 6, 7, 12, 13, 14, 16, 23 4.1: 17,b18
9	4.2 4.3, 4.4	Subspaces Spanning Sets, Linear independence	4.2: 1, 6, 8a, 11 4.3: 2, 3, 6, 8 abcd 4.4: 1, 2, 7
10	4.5, 4. 6 1.8	Coordinates and Basis Dimension Linear Transformations	4.5: 3, 7, 13 4.6: 1, 5, 8, 18 1.8: 13abc, 27, 29, 32, 36, 37, 46
11	5.1 5.2	Eigenvalues and Eigenvectors Diagonalization	5.1: 5ab, 7, 8,14, 19, 20, 21, 22, 24, 25ab, 32, 33 5.2: 6, 7, 8, 19, 20c
12		REVIEW	

Student Services

You may wish to access the many services available to you as a Concordia student. An overview of these resources can be found here: <https://www.concordia.ca/students/services.html>

Academic Integrity and the Academic Code of Conduct

This course is governed by Concordia University's policies on Academic Integrity and the Academic Code of Conduct as set forth in the Undergraduate Calendar and the Graduate Calendar. Students are expected to familiarize themselves with these policies and conduct themselves accordingly. "Concordia University has several resources available to students to better understand and uphold academic integrity. Concordia's website on academic integrity can be found at the following address,

which also includes links to each Faculty and the School of Graduate Studies: <https://www.concordia.ca/conduct/academic-integrity.html>" [*Undergraduate Calendar, Sec 17.10.2*]

Behaviour

All individuals participating in courses are expected to be professional and constructive throughout the course, including in their communications.

Concordia students are subject to the [Code of Rights and Responsibilities](#) which applies both when students are physically and virtually engaged in any University activity, including classes, seminars, meetings, etc. Students engaged in university activities must respect this Code when engaging with any members of the Concordia community, including faculty, staff, and students, whether such interactions are verbal or in writing, face to face or online/virtual. Failing to comply with the Code may result in charges and sanctions, as outlined in the Code.

Intellectual Property

Content belonging to instructors shared in online courses, including, but not limited to, online lectures, course notes, and video recordings of classes remain the intellectual property of the faculty member. It may not be distributed, published or broadcast, in whole or in part, without the express permission of the faculty member. Students are also forbidden to use their own means of recording any elements of an online class or lecture without express permission of the instructor. Any unauthorized sharing of course content may constitute a breach of the [Academic Code of Conduct](#) and/or the [Code of Rights and Responsibilities](#). As specified in the [Policy on Intellectual Property](#), the University does not claim any ownership of or interest in any student IP. All university members retain copyright over their work.

Use of Concordia email

Your [Concordia email](#) is the official channel for all university communications, as required by the university's [Policy on Concordia email accounts for students and employees](#). Please use your Concordia email for all communication related to this course and check it regularly so you don't miss important information. [Learn more about how to access your Concordia email](#).

As a student, you are expected to follow the email policy and to use your Concordia email in a respectful and responsible manner. The policy helps ensure that communication across the university is secure, reliable, and consistent.

Extraordinary circumstances

In the event of extraordinary circumstances and pursuant to the [Academic Regulations](#) the University may modify the delivery, content, structure, forum, location and/or evaluation scheme. In the event of such extraordinary circumstances, students will be informed of the change.