

COURSE SYLLABUS



COURSE TITLE: MATH-125: Introduction to Linear Algebra

CLASS SECTION: 001

TERM: Winter 2024

COURSE CREDITS: 3

DELIVERY METHOD(S): LEC

Camosun College campuses are located on the traditional territories of the Ləkʷəŋən and W̱SÁNEĆ peoples. We acknowledge their welcome and graciousness to the students who seek knowledge here.

Learn more about Camosun's [Territorial Acknowledgement](#).

Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable explanation in advance, you will be removed from the course and the space offered to the next waitlisted student.

INSTRUCTOR DETAILS

NAME: Laura Shepherd

EMAIL: shepherd@camosun.bc.ca

OFFICE: E258

HOURS: M-F 10:30-11:20 & Tu-F 12:30-1:20

CALENDAR DESCRIPTION

This course provides the fundamentals of linear algebra for mathematics, science and engineering students. Topics include: vectors, systems of linear equations, Gaussian reduction, matrices, vector spaces, change of basis, determinants, Cramer's rule, eigenvectors, and complex numbers.

PREREQUISITE(S):

All of:

- C in MATH 100

CO-REQUISITE(S):

Not Applicable

EXCLUSION(S):

Not Applicable

COURSE LEARNING OUTCOMES / OBJECTIVES

Upon completion of this course a student will be able to:

1. Perform vector operations and use vectors to write parametric equations for lines and planes.
2. Use the dot product to find projections and to find angles between vectors.
3. Solve linear systems using row reduction.
4. Perform matrix operations and give examples of matrices with specific properties.

5. Determine if a transformation is a linear transformation and find the standard matrix for a linear transformation.
6. Find the inverse of an invertible matrix and use it to solve matrix equations.
7. Construct and use elementary matrices to perform row operations.
8. Find LU decompositions.
9. Determine whether a set of vectors is a basis and be able to prove simple facts about linear independence and spans. Find the components of a vector with respect to a given basis.
10. Determine whether a mathematical system is a subspace, a vector space, or an inner product space.
11. Use the Gram-Schmidt process to construct an orthonormal basis.
12. Find the matrix of a linear transformation in a different basis.
13. Find matrices for general linear transformations. Determine the kernels and ranges of general linear transformations.
14. Find determinants by cofactor expansion and use Cramer's rule to solve linear systems of equations.
15. Use the cross product to find areas, volumes, and perpendicular vectors.
16. Find eigenvalues and eigenvectors of matrices and linear transformations and construct diagonal matrices for the transformations.
17. Perform operations with complex numbers including finding the n th roots of complex numbers.

REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

Textbook: Elementary Linear Algebra (8th. Edition) by Ron Larson

Calculator: SHARP EL-531 Scientific Calculator

EVALUATION OF LEARNING

DESCRIPTION	WEIGHTING
In Class Questions: Once a week, during the first 5 minutes of class, there will be a question based on the previous lectures content.	5%
Term Tests: There will be 3 terms tests. There are no make-up tests.	55%
Final Exam: Students must be available to write the exam during the scheduled date, time and place.	40%
TOTAL	100%

COURSE GUIDELINES & EXPECTATIONS

MATH 125 is a very difficult course. Success in the course will require a lot of your time, approximately 4 hours of studying each and every day. Besides learning the course material through the lessons, its important that you work diligently through numerous homework problems so as to reinforce your understanding, not to mention prepare yourself for the in class questions, tests and the final exam. Be sure to keep up with the course material and do not let yourself fall behind.

SCHOOL OR DEPARTMENTAL INFORMATION

The Camosun Math Help Center is located in E224. This is a drop in centre where you can get help with your homework. The hours will be posted on door.

STUDENT RESPONSIBILITY

Enrolment at Camosun assumes that the student will become a responsible member of the College community. As such, each student will display a positive work ethic, assist in the preservation of College property, and assume responsibility for their education by researching academic requirements and policies; demonstrating courtesy and respect toward others; and respecting expectations concerning attendance, assignments, deadlines, and appointments.

SUPPORTS AND SERVICES FOR STUDENTS

Camosun College offers a number of services to help you succeed in and out of the classroom. For a detailed overview of the supports and services visit <http://camosun.ca/students/>.

Academic Advising	http://camosun.ca/advising
Accessible Learning	http://camosun.ca/accessible-learning
Counselling	http://camosun.ca/counselling
Career Services	http://camosun.ca/coop
Financial Aid and Awards	http://camosun.ca/financialaid
Help Centres (Math/English/Science)	http://camosun.ca/help-centres
Indigenous Student Support	http://camosun.ca/indigenous
International Student Support	http://camosun.ca/international/
Learning Skills	http://camosun.ca/learningskills
Library	http://camosun.ca/services/library/
Office of Student Support	http://camosun.ca/oss
Ombudsperson	http://camosun.ca/ombuds
Registration	http://camosun.ca/registration
Technology Support	http://camosun.ca/its
Writing Centre	http://camosun.ca/writing-centre

Academic Integrity

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.13.pdf> for policy regarding academic expectations and details for addressing and resolving matters of academic misconduct.

Grading Policy

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf> for further details about grading.