

MATH*1160: Linear Algebra I

Course Outline

General Information

Course Title

Linear Algebra I

Course Description

This course provides an introduction to linear algebra in Euclidean space. Topics covered include: N-dimensional vectors, dot product, matrices and matrix operations, systems of linear equations and Gaussian elimination, linear independence, subspaces, basis and dimension, matrix inverse, matrix rank and determinant, eigenvalues, eigenvectors and diagonalization, orthogonalization and projections, linear transformations. Some fundamental proofs and applications of these topics will be included.

Credit Weight

0.50 credits

Department

Mathematics and Statistics

Campus

University of Guelph

Semester Offering

Winter 2017

Prerequisites

4U Calculus and Vectors or 4U Advanced Functions.

Class Schedule and Location

Tuesday, Thursday (2:30-3:50), Alexander 100.

Instructor Information

Instructor

Andrew Skelton

Instructor E-mail

skeltona@uoguelph.ca

Office Hours

Tuesday (11:00-12:30), Wednesday (12:00-1:00), MacNaughton 517.

Course Content

Learning Outcomes

After successful completion of this course, students should be able to

- use a variety of techniques to solve systems of linear equations,
- apply concepts of matrix algebra to solve linear algebra problems and applications to real-world problems,
- identify and describe properties of vector spaces, bases, and subspaces,
- discover applications of linear transformations,
- develop techniques for proving properties of vectors and matrices,
- give precise definitions for abstract linear algebra concepts,
- extend familiar geometric concepts of linear algebra to abstract spaces.

Lecture Content

- systems of linear equations;
- matrix algebra;
- linear combinations
- linear independence;
- vector spaces, subspaces, basis and dimension;
- linear transformations;
- eigenvalues and eigenvectors;
- diagonalization;
- inner product spaces, orthogonality.

Course Assignments and Tests

20% - Assignments (5; due by noon on January 27; February 17; March 10, 17, 31)

20% - Term Test #1 (Thursday, February 9 in class)

20% - Term Test #2 (Thursday, March 23 in class)

40% - Final Exam (Monday, April 17, 2:30-4:30, location TBD)

The tests and final exam are worth a total of 80 percentage points of your final grade. You must obtain at least 40 points out of these 80 points to pass the course. If you do not, your final grade will be the percentage you received on the tests and the final exam.

Course Resources

Required Texts

Schaum's Outline of Linear Algebra, 5th Edition, by Lipschutz and Lipson (2012).

Course Website

Course announcements, blank lecture notes, practice questions and grades will be posted on the course website. <https://courselink.uoguelph.ca>. It is your responsibility to check that posted marks are accurate.

Course Policies

Assignments

Assignments will be posted online and will be submitted through a website called Crowdmark. Instructions for submission will be included in the posted assignment. No late assignments will be accepted without appropriate documentation. Lab assignments must be clear, organized and neat with full solutions presented in order.

Use of electronic devices and recording of lectures

Electronic recording of classes is expressly forbidden without consent of the instructor. When recordings are permitted they are solely for the use of the authorized student and may not be reproduced, or transmitted to others, without the express written consent of the instructor.

University Policies

Academic Accommodation of Religious Obligations

If you are unable to complete a course requirement due to religious obligations, please let the instructor know within the first two weeks of class. See the academic calendar for more information:

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-accomrelig.shtml>

Academic Consideration

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor in writing, with your name, student ID#, and e-mail contact. See the academic calendar for information on regulations and procedures:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Academic Misconduct

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community, faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring.

University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection. Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Accessibility

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Centre for Students with Disabilities as soon as possible. Contact CSD at 519-824-4120 ext. 56208 or email csd@uoguelph.ca.

Drop Date

The last date to drop this course, without academic penalty, is Friday, March 10. For regulations and procedures for Dropping Courses, see the Academic Calendar:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>