

Math 20 — Linear Algebra

Time and place: 12:45–1:50pm, MWF, WH 311

Professor: David J. Hunter, Ph.D.

e-mail: dhunter@westmont.edu
Office Phone: x6075
Office: Winter Hall 303
Office Hours: By appointment.

Catalog Description: “(Four credit hours) Prerequisite: MA 010 or 010H. Vector spaces, linear transformations, matrices, eigenvalues and eigenvectors; orthogonality; applications to differential equations, and optimization problems.”

Core Knowledge: This course is an introduction to linear algebra for mathematics and science majors. Linear algebra is a gateway to higher mathematics; the topics we will study will be used in subsequent courses. This is also one of the most practical areas of mathematics, with many applications to physics, engineering, economics, computing, robotics, graphics, and other fields.

Communication: We will emphasize the development of mathematical writing skills. In particular, you will be expected to make significant progress in your ability to write proofs. There will be frequent written assignments, as well as daily reading assignments.

Creativity: The written assignments throughout the course will require you to be creative in how you approach novel problems in linear algebra. We will approach a range of problems using a variety of different techniques, so you will grow in your ability to navigate unfamiliar mathematical territory.

Christian Perspective: While mathematics is primarily a pure and abstract discipline, our motivation for its study is largely guided by an intuitive aesthetic; we study math because we find it intrinsically beautiful. It is therefore significant (maybe even theologically significant) that we find such important connections between mathematics and the physical universe. Math is a human pursuit, but hopefully you will see it as the work of those that are just “a little lower than the heavenly beings.” (Psalm 8:5)

Textbook and Equipment: The course will cover Chapters SLE, V, M, VS, D, E, LT, and (hopefully) R of *A First Course in Linear Algebra*, by Rob Beezer, version 2.30. You will find several different freely downloadable formats at <http://linear.ups.edu> (follow the “Download” link). This book is freely-distributable under the terms of the GNU Free Documentation License. Calculators are not necessary, and are not allowed on exams. However, we will occasionally use *Sage* to do numerical and symbolic calculations. This mathematical software is also a free, open-source project. At <http://sagemath.org> you can download the program or use it online.

Grading: Your grade will be calculated as follows:

Written Assignments:	30%
Reading Assignments:	5%
Tests #1 and #2:	20% each
Final Exam:	25%

A short written assignment will be due almost every Tuesday, Thursday, and Saturday by 1pm. These papers can be left in an envelope outside my office in Winter Hall. Electronic responses to reading questions will be due almost every Monday, Wednesday, and Friday at 12:30pm. These responses will be entered on the **eureka** page for the course.

Other Policies: If you miss a significant number of classes, you will almost definitely do poorly in this class. I consider it excessive to miss more than three classes during the course of the semester. If you miss more than six classes without a valid excuse, I reserve the right to terminate you from the course with a grade of F. Work missed (including tests) without a valid excuse will receive a zero.

I will post the assignments and other course materials on the **eureka** page for this course. Go to <https://eureka.westmont.edu>

and make sure you are subscribed to this course; a link should appear after you have logged in. I expect you to check this page, along with your email, on a regular basis. If you use a non-Westmont email account, please forward your Westmont email to your preferred account.

Learning communities function best when students have academic integrity. Cheating is primarily an offense against your classmates because it undermines our learning community. Therefore, dishonesty or plagiarism will result in a zero for the work in question, and repeated or major infractions will result in expulsion from the course with a grade of F.

Tentative Schedule: We will try to conform to the following schedule, although it is subject to revision at the instructor's discretion. The **eureka** page will tell you more detailed information about when work is due.

- Chapters SLE and V: Systems and Vectors.
Test #1 (through Chapter V)
- Chapters M and VS: Matrices and Vector Spaces.
Test #2 (through Chapter VS)
- Chapters D, E, LT and R: Transformations and Representations.
Final Exam: Monday, 4/30/2012, noon-2:00pm. (cumulative)

Students who have been diagnosed with a disability (learning, physical or psychological) are strongly encouraged to contact the Disability Services office as early as possible to discuss appropriate accommodations for this course. Formal accommodations will only be granted for students whose disabilities have been verified by the Disability Services office. These accommodations may be necessary to ensure your full participation and the successful completion of this course. Please contact Sheri Noble, Interim Coordinator of Disability Services (x6186, snoble@westmont.edu) as soon as possible.