

Course Syllabus (All Sections)

Linear Algebra (MATH 264)

- Description:** A study of linear algebra and an introduction to mathematical reasoning. Topics include systems of linear equations, matrices, determinants, vectors in n -space, abstract vector spaces, and linear transformations.
- Credit Hours:** 3
- Audience:** Required for mathematics majors. Prerequisite for MATH 266, 270*, 322*, and 370* (* indicates requirement is one of MATH 264 or 260).
- Prerequisites:** MATH 132 or 220
- Textbook:** Our text is *Linear Algebra*, by Jim Hefferon. A PDF of this book is in Blackboard, and also <http://joshua.smcvt.edu/linearalgebra/book.pdf>
- Technology:** No software is required for purchase. *Maple 18* (available on campus computers) may be useful on occasion. Course material and grades are often maintained in Blackboard, at the discretion of the instructor.
- Notice of Cancellation:** If class is cancelled on short notice, a message will go out by e-mail, to your university e-mail address.
- University-Wide Notices:**
- ACCESS And ACCOMMODATIONS: The Access & Accommodation Resource Center (AARC) is the campus office that works with students to provide access and accommodations in cases of diagnosed mental or emotional health issues, attentional or learning disabilities, vision or hear limitations, chronic diseases, or allergies. You can contact the office at aarc@valpo.edu or 219.464.5206. Students who need, or think they may need, accommodations due to a diagnosis, or who think they may have a diagnosis, are invited to contact AARC to arrange a confidential discussion with the AARC office. Further, students who are registered with AARC are required to contact their professor(s) if they wish to exercise the accommodations outlined in their letter from the AARC.
- EMERGENCIES: VU's Emergency Notification System (ENS) uses multiple forms of communication, including e-mail, building alarms, outdoor sirens, message boards, computer alerts, Twitter, and public address messaging. Please review the specific procedures for this class found in Blackboard. Remember: "Siren inside, GO outside; Siren outside, GO inside." To evacuate, gather your personal belonging quickly and proceed to the nearest exit. Do not use the elevator. To shelter in place, move away from the windows and stay low to the ground; lock or barricade the door if there is a threat of violence.
- TITLE IX: Valparaiso University strives to provide an environment free of discrimination, harassment, and sexual misconduct (sexual harassment, sexual violence, dating violence, domestic violence, and stalking). If you have been the victim of sexual misconduct, we encourage you to report the incident. If you report the incident to a University faculty member or instructor, she or he **must notify** the University's Title IX Coordinator about the basic facts of the incident. Disclosures to University faculty or instructors of sexual misconduct incidents are **not confidential** under Title IX. **Confidential** support services available on campus include: Sexual Assault Awareness & Facilitative Education Office "SAAFE" (219-464-6789),

Counseling Center (219-464-5002), University Pastors (219-464-5093), and Student Health Center (219-464-5060). For more information, visit <http://www.valpo.edu/titleix/>.

STUDENT ATHLETES: Student-athletes are excused from class for university-sponsored competition but are not exempt from completing course work missed during those absences. The manner in which work will be made up is at the discretion of the instructors, and students are responsible for obtaining any class notes or other course material. Student-athletes are to provide the Class Excuse form to all faculty members for the courses in which they are enrolled during the first week of classes or as soon as schedules are set. Student-athletes may not be penalized solely for missed class time due to excused absences.

Course Goals:

- A. Students can perform computational procedures required in linear algebra and apply these procedures for problem solving.
- B. Students understand mathematical concepts and terminology in linear algebra.
- C. Students prepare for success in disciplines which rely on the content of linear algebra.

Topical Objectives (with goals addressed). Preface: *Students will be able to ...*

1. carry out basic arithmetic operations on vectors and matrices, including inversion and determinants. (A, C)
2. solve systems of linear equations using fundamental techniques such as row reduction. (A, C)
3. know the basic terminology of linear algebra, including linear independence, spanning, basis, rank, nullity, subspace, and linear transformation. (B, C)
4. define, identify, and characterize abstract concepts such as vector spaces and inner product spaces. (B, C)
5. find eigenvalues and eigenvectors of a matrix or a linear transformation and use them to diagonalize a matrix. (A, C)
6. compute projections and determine orthogonality among vectors using, e.g., the Gram-Schmidt orthonormalization process and orthogonal matrices. (A, C)
7. solve problems related to common applications of linear algebra by using tools such as Cramer's rule and the method of least squares. (C)

General Objectives (with goals addressed). Preface: *Students will be able to ...*

8. carry over and apply knowledge from Calculus I and II, such as differentiation and integration techniques. (A, C)
9. read mathematical theorems and identify their hypotheses and conclusions. (A, C)
10. check results and recognize alternate correct forms, as well as those which are obviously false. (B, C)
11. use proper mathematical notation and vocabulary. (B, C)
12. write clear and detailed solutions to assigned problems. (B, C)