

Campbellsville University
MTH 350-01
Linear Algebra (3 semester hours)

MEETING TIMES: TR 12:30 - 1:45
TEXTBOOK: Elementary Linear Algebra 11th ed. by Anton and Rorres

INSTRUCTOR: Chris Bullock
OFFICE: CH 314
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OFFICE HOURS: MWF 12-1 and 2-3
TR 2-3:15
or by appointment

1. DESCRIPTION OF COURSE: An introduction to Linear Algebra including historical development of linear algebra, finite dimensional vector spaces, systems of linear equations, linear transformations, determinants, eigenvalues and eigenvectors, orthogonality, and Jordan canonical form. Prerequisite: MTH 310 or consent of instructor.
2. MATHEMATICS PROGRAM OBJECTIVES: As an upper division course in the mathematics program, this course will meet the following requirements:
 1. Students will demonstrate analytical thinking skills by employing computation and mathematical modeling to solve problems.
 2. Students will construct and communicate, in writing, logical arguments using appropriate mathematical language and terminology.
 3. Students will apply their mathematical knowledge of calculus, algebraic functions, and probability and statistics to find solutions to modern day problems that exist in the real world.
 4. Students will be able to employ technology to further their knowledge of conceptual mathematical ideas and problems.

Students' performance with regard to these objectives will be assessed by means of homework assignments and exams.

3. COURSE OBJECTIVES: Students are expected to gain a working knowledge of linear algebra, a subject which features prominently in many areas of science today. Linear algebra is used frequently in engineering, physics, and computer science. Students will benefit from exposure to a variety of applied problems in this course. Also, students will be expected to demonstrate knowledge of the theory which underlies linear algebra. This knowledge is essential for further study of mathematics in graduate school or the workplace.

4. COURSE OUTLINE:

- Section 1.1: Introduction to Systems of Linear Equations
- Section 1.2: Gaussian Elimination
- Section 1.3: Matrices and Matrix Operations
- Section 1.4: Algebraic Properties of Matrices
- Section 1.5: Elementary Matrices; Inverses of Matrices
- Section 1.6: Linear Systems and Invertible Matrices
- Section 1.7: Diagonal, Triangular, and Symmetric Matrices
- Section 1.8: Matrix Transformations
- Section 2.1: Determinants by Cofactor Expansion
- Section 2.2: Evaluating Determinants by Row Reduction
- Section 2.3: Properties of Determinants; Cramer's Rule
- Section 4.1: Vector Spaces
- Section 4.2: Subspaces
- Section 4.3: Linear Independence
- Section 4.4: Coordinates and Basis
- Section 4.5: Dimension
- Section 4.7: Row Space, Column Space, and Null Space
- Section 4.9: Matrix Transformations in $\mathbb{R} \times \mathbb{R}$ and $\mathbb{R} \times \mathbb{R} \times \mathbb{R}$
- Section 4.11: Geometry of Matrix Operations
- Section 5.1: Eigenvalues and Eigenvectors
- Section 5.2: Diagonalization

Note: Topics may be added or deleted depending upon time constraints

5. EVALUATION: There will be a total of four tests including a final exam. Each test will be worth 100 points. Also, there will be a homework grade worth 100 points. Thus, there will be a total of 500 attainable points in this class. The grading scale will be as follows:

- 90-100% A
- 80-89% B
- 70-79% C
- 60-69% D
- 0-59% F

Homework will be assigned and graded after almost every class meeting. Each homework assignment will consist of a variable number of questions. Each homework problem will be graded as follows: 2 points for a correct solution, 1 point for a partially correct solution, 0 points for no effort or a completely incorrect solution. The percentage of earned points out of the total points will be recorded for each assignment. At the end of the semester, these homework grades will be averaged to get the final 100-point homework grade. This grade will then be averaged with the four test grades to obtain the final grade for the class.

6. REQUIREMENTS: The tentative dates for the exams are as follows:
 - Exam #1: Sep 22
 - Exam #2: Oct 18
 - Exam #3: Nov 15Final: Thursday, Dec 15 from 11-12:30

7. ATTENDANCE: Campbellsville University has an attendance policy which states that a student who misses two weeks worth of a class (for any reason) receives a warning. Thus, any student missing 4 class periods in this class will receive a warning. Any student who misses four weeks worth of a class (for any reason) is automatically withdrawn from the class with a failing grade. Thus, any student missing 8 class periods in this class will be withdrawn from the class. PLEASE NOTE THAT, BY THIS POLICY, ANY ABSENCE COUNTS, WHETHER EXCUSED OR UNEXCUSED.
 - Attendance will be recorded by me every class period at the beginning of class. If you are late for class, you may be counted as absent. It is your responsibility to notify me at the end of class if you think this may have occurred.
 - You must notify me in advance if you are going to miss a test. You may contact me by phone or by e-mail. Make-up exams are possible if I am notified in advance and if I think the excuse is reasonable.

8. CALCULATORS: Only scientific or graphing calculators will be permitted for use on exams. Cell phones and other such forms of technology are strictly prohibited. It is your responsibility to make sure that you have an acceptable calculator for each exam. Calculators may not be shared under any circumstances.

9. ADDITIONAL SOURCES:
 - Linear Algebra and its Applications by Lay
 - Linear Algebra by Tucker

10. DISABILITIES: Disability Statement: Campbellsville University is committed to reasonable accommodations for students who have documented learning and physical disabilities, as well as medical and emotional conditions. If you have a documented disability or condition of this nature, you may be eligible for disability services. Documentation must be from a licensed professional and current in terms of assessment. Please contact the Director of Disability Services at (270) 789-5450 to inquire about services.

11. SECURITY: Campus Security: Cell Phone: (270) 403-3611; Office: (270) 789-5556

12. TITLE IX STATEMENT: Campbellsville University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with Title IX of the Education Amendments of 1972 and guidance from the Office for Civil Rights, the University requires all responsible employees, which includes faculty members, to report incidents of sexual misconduct shared by students to the University's Title IX Coordinator.

Title IX Coordinator:

Terry VanMeter

1 University Drive

UPO Box 944

Administration Office 8A

Phone – 270-789-5016

Email – twvanmeter@campbellsville.edu

Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at:

www.campbellsville.edu/titleIX