

Course Syllabus

Linear Systems and Matrices (Math 260)

Description: *Students will study properties of, and solutions to, linear equations and system of linear equations. Related topics include matrices, properties of matrices, matrix algebra, determinants, eigenvalues, real vectors in two and three dimensions, vector algebra (including dot and cross products), linear combinations, and linear independence. This class is not open to students with credit for MATH 264.*

Credit Hours: 1

Audience: Required for engineering and meteorology majors. Either/or prerequisite (with Math 264) for Math 322, 330, 370.

Prerequisites: Math 114.

Format: 1 lecture (50 min) per week (15 weeks)

Textbook: *Differential Equations and Linear Algebra, 2nd Ed*, by Farlow. (Required)
ISBN: 9780131860612

Software: Use of *Maple 16* is recommended (available on campus computers; purchase of student version is recommended).

Internet: Course material is maintained in Blackboard.

Course Goals:

- A. Students can perform exact procedures for finding solutions to problems of linear algebra.
- B. Students understand fundamental concepts of linear algebra.
- C. Students prepare for success in disciplines which rely on linear algebra, and in more advanced mathematics which incorporate linear algebra, such as differential equations, optimization, and numerical analysis.

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

- 1. define and identify systems of linear equations (A, B)
- 2. understand fundamental concepts of matrix algebra and perform calculations using matrices (A, B).
- 3. understanding concepts related to vector spaces, including subspaces, spanning, linear independence, basis, and dimension (B)
- 4. find and interpret eigenvalues and eigenvectors of a system of linear equations (A, B, C).
- 5. find and interpret solutions to systems of linear equations, (A, B)
- 6. solve systems of linear equations using matrix techniques (A)

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

- 7. identify when certain theorems apply, and if not, identify what hypothesis is violated (B)

8. check results (produced both manually and with technology) and recognize those which are obviously false (B)
9. recognize alternate forms of a correct result (B)
10. use proper mathematical notation and vocabulary (C)
11. write clear and detailed solutions to assigned problems (C)