

Math 238
Linear Algebra with Differential Equations
Fall 2012

Basic Info:

Meeting Times/Locations

- Monday, Wednesday, Friday Roop Hall 212, 10:10–11:00am
- Thursday Roop Hall 327, 9:30–10:45am

Instructor: Dr. Joshua Ducey

Email: duceyje@jmu.edu

Website: <http://educ.jmu.edu/~duceyje>

Office Location: Roop 339

Office Hours:

- Monday 9:05–9:55am
- Wednesday 11:15–12:05pm
- Thursday 11:00–12:00pm
- Friday 1:45–2:45pm

Book: Linear Algebra and Differential Equations by Peterson and Sochaki

Course Goals and Content:

The student should develop an understanding of the basic theory, applications, and connections of Linear Algebra and Differential Equations. We will cover topics from Chapters 1–6 of the text.

Homework:

I will assign problems to you each week. Your solutions will be collected each Friday at the beginning of class. You will be graded in part on your presentation of your work and your clarity of thought. This means you should be turning in a “final draft” of your work to me, after having thought about it and having revised it several times.

I cannot stress enough the importance of the homework. Your consistent hard work on the material outside of class is absolutely the best thing you can do to succeed in this course.

Success:

Come to class **everyday.**

Read your book **everyday.**

Work on the homework **everyday.**

Getting Help:

You are encouraged to work on homework with your classmates. However, you must write up your solutions independently. My office hours are fixed times when I will be in my office to help you, but you can also make an appointment to see me at a different time (just email me).

The Science and Math Learning Center offers free tutoring. No appointment necessary, just walk right in. I strongly encourage you to take advantage of this service. It is located in Roop 200. There is also an Rose Library location, see their website for details:

<http://www.jmu.edu/smrc>

Evaluation:

Homework: 20%

Three Exams: 60%

Cumulative Final Exam: 20%

Grade Scale:

[90 – 100] A- to A

[80 – 90) B- to B+

[70 – 80) C- to C+

[60 – 70) D- to D+

[0 – 60) F

Final Exam Time:

Wednesday 12/12/2012, 8:00–10:00am

General University Policy: www.jmu.edu/syllabus

Goals of the Course:

- (1) To develop an understanding of the logical structure and style of mathematics by:

- Using reason in an orderly, cogent fashion.
- Writing clear, well organized solutions to problems.
- Evaluating critically and using mathematical definitions.
- Construction proofs of mathematical theorems using direct and indirect arguments.

Structure refers to the foundations of mathematics and to the techniques used to build on those foundations. Style refers to the clarity, elegance, efficiency, and precision desirable in mathematical expression.

- (2) To develop computational skills such as:

- Using matrices to solve systems of linear equations.
- Determining whether a given set of vectors forms a basis for a vector space.
- Determining the matrix of a linear transformation relative to given bases.
- Finding eigenvalues and bases for eigenspaces of a square matrix.
- Solving first-order separable and exact differential equations and linear and systems of linear differential equations.

- (3) To develop an understanding of the theory of linear algebra and differential equations by knowing:

- The concept of a vector space and subspace.
- The concepts of a spanning set, linear dependence, basis, and

dimension of a vector space.

- The basic concepts of matrices and linear transformations.
- The basic concepts of determinants.
- Existence and uniqueness of solutions to initial value problems.
- The concepts about solutions of linear systems of linear differential equations.

Nature of the Course Content:

MATH 238. Linear Algebra with Differential Equations.

4 credits. *Offered fall and spring.*

Matrices; determinants; vector spaces; linear transformations; eigenvalues and eigenvectors; separable, exact and linear differential equations; and systems of linear differential equations. *Prerequisite: MATH 236. Not open to students with credit in MATH 300 or MATH 336 without departmental permission.*