Instructor: Dr. Rebecca Field	Office: Roop 114	Phone: 540-746-1231
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### Class Times

Section 3 MWF 11:15am-12:05pm and Tues 11:00am-12:15pm in in Burruss 126 Section 5 MWF 2:30-3:20pm in Burruss 126 and Tues 2:00-3:15 in Burruss 141

### Office hours

M 12:30-2:00pm, Tu 12:30-1:30pm and 3:30-4:30pm or by appointment, Roop 114. I am usually not available on Thursdays.

You can always make an appointment to come see me!

## Textbook

Peterson/Sochacki Linear Algebra and Differential Equations, 2002 Addison Wesley, at the JMU bookstore.

#### Grades

There will be four in class tests worth 100 points each, one chapter quiz worth 75 points and one cumulative final exam worth 300 points. There will be daily quizzes worth 2-5 pints each (approximately 100 points total). The rest of your grade (125 points) will be determined by class participation/review quizzes. You will be given points for giving definitions and theorems from the reading as well as presenting examples and doing problem. Extra credit can be earned by attending and handing in a written summary of math talks such as weekly colloquia/job talks or by participating in the Problem of the Week with a reasonable attempt at a solution. All of your written homework and class notes are to be written in a bound notebook (see Notebook Guidelines) and you will be allowed to bring this notebook with you when you go to the board as well as for some portion of time on many of your exams and the final. (That is, some exams will have an open notebook period - usually 15 minutes. NB: this does not make the exam easier!!)

Your final grade will be determined using statistical methods, the class average, and historical class averages. I do not use a predetermined scale. I reserve the right to decide borderline grades based on participation, effort and improvement. You *must* get at least 50% of the final exam correct in order to pass the course.

### **Daily Quizzes**

You are expected to read each section before class, and come to class prepared to take a daily quiz and answer questions. Reading a math book is not like reading a novel; you may have to read some passages multiple times, take notes, and work carefully through examples. The daily quizzes add up over time and are a part of your final grade, so come prepared.

### Homework

There will be two types of homework in this class. For-credit homework will be *online* using WeB-Work (links to the course webwork page are on the course website). Everyone will be required to do the online tutorial and the first online homework assignment (covering sections 1.1-1.3 of the text) due on January 16. After that, you will be asked if you would like to be a for-credit-homework-student or a do-homework-on-your-own-student. If you choose to do homework for credit, your homework grades for the sections covered will be combined with your individual exam grades at the end of the semester (namely, doing well on the homework will help you test grades). If you do

not do homework for a grade, you will still need to do problems in order to pass the class!!! The course website lists suggested problems for each section. Use your own judgment on whether *you in particular* need to do more or less than the suggested assignment for a specific section. You will have opportunities to ask questions about either sort of homework problem in class, especially on Tuesdays (our long class period). No matter which option you choose, you will want to do your homework in your course notebook so that you can use it for exams.

The most important thing you can do to get a good grade in this course isn't on the list of things that numerically determines your grade: it is doing homework. Lots of it. Every day.

### Absences

You must be in class each quiz day, beginning at the start of the class period. I do not give makeup quizzes or tests but in some circumstances I may be able to "excuse" you from a quiz or a test. If you do miss class, it is your responsibility to get notes and announcements from a classmate *and read them before the next class*. If you have a problem with an exam date, please notify me beforehand. If an emergency causes you to miss an exam or quiz, you should contact me and explain your situation. My sympathy with your plight will be determined by how quickly you contact me.

# Calculators

You will not be allowed to use calculators on any exams or quizzes. Access to a computer with mathematical software such as Mathematica, Maple or MATLAB can be especially helpful. Cell phones may not be used as calculators or in any capacity during tests or class.

## Honor Code

I encourage you to work together in groups on homework assignments outside of class, but any work you hand in must be written up independently in your own words. All material in your notebook must be written by you by hand. I take the honor code very seriously, and so should you. Any instances of suspected cheating or academic dishonesty will be referred to the JMU Honor Board for investigation.

# Getting Help

The Science/Math Learning Center in Roop 200 is open 10–8 MTuWTh, 10–2 F, and 5–8 pm Sat. The SMLC should be your first line of defense when working out homework problems. Many students just choose to do their homework in the SMLC all the time, so that help is always available when they need it.

### 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.
- Constructing 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 and 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.