

SYLLABUS: MATH 214-001, Fall 2017

Instructor: Dr. Stephen Saperstone, Exploratory Hall 4406; TEL: 703.993.1460; FAX: 703.993.1491; Mobile/Text (to be used in extreme circumstances when you can't reach me otherwise): 703.307.4370

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Office hours: TR 3:00pm -4:00pm, and by appointment in Exploratory Hall - 4406

Classroom: The lectures meet in Planetary Hall Room 131, TR @ 1:30pm-2:45pm

Recitations: TA is Heath Camphire and meets on Tuesday mornings. Check the Patriot Web for specific times and rooms.

Text: There is no text book. All material is available online at [ODEweb](#).

Content: This course will cover most of the material in Lectures 1-7, 10-12, and 14-25

Prerequisites: A grade of at least C in Multivariable Calculus (Math 213 or 215) & Linear Algebra (Math 203)

Course Objectives:

1. Develop techniques to solve a variety of scalar ODEs and higher dimensional linear ODEs and linear systems of ODEs. Determine qualitative properties to solutions of nonlinear ordinary differential equations without solving the equations.
2. How to analyze the behavior of solutions to nonlinear ODEs without having a formula for the solutions. Most ODEs require this "out of the box" thinking.

Software: Mathematica is the computer algebra software of the Mathematical Sciences Department. You may want to use Mathematica in your homework assignments. Mathematica is available to all students for free. Scroll down for student directions at the [Mathematica at Mason website](#).

Homework:

- Homework exercises will be assigned and due weekly at recitation. Late homework will not be accepted. Most solutions will be posted at the time the homework is returned. Some also will be discussed in the recitations. Each exercise solution will be graded on an integral scale of 0 to 4. A grade of 5 will be assigned to an exceptional solution.
- Solving problems is perhaps the most important component of this course; it provides you with regular feedback on whether or not you are keeping up with the material, and it challenges you to creatively apply what you have already learned. See the [assignment](#) page.
- Collaboration is an important component of learning mathematics and I encourage you to work with your classmates. By "work with," I mean that every member of a collaborative effort is expected to be an active contributor.

- Use Wolfram Alpha, Mathematica, Matlab, or any other software you like just to check your solutions. I will not accept software solutions other than plots.

Exams: Three exams and a comprehensive final exam: *tentative* dates:

Exam 1	21 September
Exam 2	26 October
Exam 3	5 December
Final Exam	19 December, 1:30pm – 4:15pm

There are no make-up exams. If you miss an exam due to a legitimate reason - which you will have to justify to me (e.g., illness), then your score on the final exam will be the score on the missed exam. If you miss two or more exams, you will fail the course. Your exam grade (not including the final exam) will be based on the average score of the two highest scores. Thus, in effect, the lowest exam score will be dropped. Notes, books, calculators, mobile phones, laptops, and any other devices - digital or analog are prohibited on exams and quizzes. A single 3x5 notecard will be permitted on each of Exams 1, 2, & 3. Tables for integrals and Laplace transforms will be provided as needed..

Quizzes: There will be a total of 12 quizzes with a maximum score of 10 points on each one. Each recitation period will start with a quiz. Quizzes will be given on all recitation days (Thursday mornings) except during weeks when there are exams The first quiz will be on Tuesday, September 5. The first quiz will be based on the first lecture on August 29. Subsequent quizzes will be based on the immediately preceding two lectures. Each quiz will be approximately 10 minutes long. The grades of the lowest two quizzes will be dropped. There are no make-ups for missed quizzes.

Seat Work: Every so often I will pose a problem based on material just covered. You will have about 10 minutes to work that problem, either with a group of seat-mates or by yourself. I will offer help as I walk around during this time. You will hand in your work for a grade based on how well you attempted to solve the problem.

Determination of Final Grade: Grades are based on the following distribution of credit.

Quizzes	10%
Seat Work	5%
Homework	20%
Exams	45%
Final Exam	20%

Grading Scale: See the following table.

A+	A	A-	B+	B	B-	C+	C	C-	D	F
∞ - 99	98 - 92	91 - 90	89 - 88	87 - 82	81 - 80	79 - 78	77 - 72	71 - 69	68 - 60	59 - 0

Oral Reviews: These are problem solving sessions led by a Learning Assistant (LA) for groups of five students. LAs ask questions that promote student discourse and that uncover student thinking and student misconceptions. LAs help you develop a deeper understanding of the important concepts and connections inherent in the course material. I will publish the LA schedule by the end of the second week of classes.

Piazza: [Piazza](#) is a free platform for instructors to efficiently manage class Q&A. Students can post questions and collaborate to edit responses to these questions. Instructors can also answer questions, endorse student answers, and edit or delete any posted content. Piazza is designed to simulate real class discussion. It aims to get high quality answers to difficult questions, fast! (The name Piazza comes from the Italian word for plaza--a common city square where people can come together to share knowledge and ideas. We strive to recreate that communal atmosphere among students and instructors.) You have already received an email from Piazza that encourages you to sign up.

Academic Integrity: GMU is an Honor Code university; please see the Office for Academic Integrity for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously and violations are treated gravely. What does academic integrity mean in this course? Essentially this: when you are responsible for a task, you will perform that task. When you rely on someone else's work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind) please ask for guidance and clarification.

Updates: Check the web site for updated information regarding exam dates, homework assignments, and exercise hints/solutions.

Registrar Information: [Important Dates](#)

Disability: If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Resources at 703.993.2474. All academic accommodations must be arranged through that office.

How to Succeed in this Course:

- Read the assigned section before each lecture and attend all lectures. Twelve-Fifteen (12-15) hours per week may not even be enough study time for many of you. It will be up to you to read and digest the lecture material as I cannot and will not speak to all the

topics in each lecture. I encourage you to ask questions about that which you don't understand. You can do this in a subsequent lecture, at my office, or in recitation.

- Have a pencil & writing tablet with you as you read the text and your lecture notes. Cover up the solution to the worked out examples before you read the solution. If you get stuck, just read as few lines as you need in order to determine how to proceed. Don't read the whole solution unless you are truly jammed.
- Join or create a study group. Brainstorm concepts, examples and solutions to exercises together. Try many more exercises than the assigned ones. I will post my solutions to the graded exercises at this website.