Math 214 Section DL1, Fall 2021
Elementary Differential Equations: Syllabus

Instructor

Alexander Shumakovitch   E-mail: ashumak@gmu.edu

Office Hours (via Blackboard Collaborate):   Mondays and Thursdays at **6:00pm − 7:00pm** or by appointment.

Lectures (3 credits)

This is an **asynchronous** course. Lectures will be recorded in advance twice a week and posted on Blackboard by **Monday and Thursday** mornings. Students are expected to watch these videos as soon as they are made available and prepare their questions for the office hours. All class related notes will be posted on Blackboard as PDF documents as well.

Teaching Assistant

Don Brusaferro   E-mail: dbrusafe@gmu.edu

Office Hours (via Zoom): Wednesdays at **10:00am − noon** or by appointment.

Recitations

Section 3D1: Wednesday **4:30pm − 5:20pm**, held **synchronously** on Blackboard.
Section 3D2: Wednesday **5:25pm − 6:15pm**, held **synchronously** on Blackboard.
Section 3D3: Wednesday **6:20pm − 7:10pm**, held **synchronously** on Blackboard.

Prerequisites

A minimum grade of 'C' in MATH 213 or MATH 215 (Calculus III).

Textbook for the Course

"Elementary Differential Equations (11th edition)" by William E. Boyce, Richard C. DiPrima, and Douglas B. Meade, Wiley Publishing (2017).

Course Content

We will cover most of Chapters 1–4, 6, and 7 from the textbook.

Additional Information about the Course

Available on the Blackboard web page for the course: `https://blackboard.gmu.edu`

Important Dates

August 23:	First lecture posted on Blackboard
September 6:	Labor Day (no classes)
September 14:	Last date to drop a course without a 'W' on the transcript
September 26 or 27:	First Midterm Exam, proctored **on-campus**
September 27:	Last date to drop a course with a 'W' on the transcript
October 11:	Fall Break (Monday classes take place on Tuesday, October 12)
November 7 or 8:	Second Midterm Exam, proctored **on-campus**
November 24–28:	Thanksgiving Recess (no classes)
December 2:	Last lecture posted on Blackboard
December 12:	Final Exam, proctored **on-campus**

Learning Outcomes

By the end of the course, you should be able to

- Identify and classify various types of differential equations;
- Find solutions to first and second order linear differential equations by qualitative analytical methods;
- Apply Laplace transforms for the resolution and analysis of differential equations;
- Find solutions to systems of linear differential equations using eigenvalues;
- Create and solve equations that model physical phenomena using appropriate methods.

Homework

Homework for each lecture will be assigned through Blackboard after that lecture is posted. You will have to login to your account on [Blackboard](#) to see the assignments. Completing these homework assignment is the **bare minimum** of work you should be doing outside of class in order to succeed in this course. Homework will **not be collected**, but it is essential that you solve all the homework problems in a timely manner in order to do well on quizzes and exams. Additionally, each homework assignment will list **recitation problems**, to be discussed at the recitations (see below), and **practice problems**.

You are strongly advised to start working on the homework as soon as the corresponding material is covered in class, while your knowledge of this material is still fresh. None of the problems assigned are going to be graded. Although you are not going to get any additional credit for solving these problems, neglecting them can significantly degrade your exam performance.

Recitation Attendance

Recitations meet weekly **synchronously** using Blackboard Collaborate. You should not only attend the recitation you signed up for, but also actively participate in it. Before coming to each recitation, you should at the very least try to solve all the problems assigned to be discussed at it. At the end of the semester, you will receive a **Recitation Attendance and Participation score** assigned by the Teaching Assistant. The main goal of the recitations is to detect any troubles you might have with the course and to help you resolve them. It is your **responsibility** to ask all the questions you have during the recitation.

Quizzes and Exams

There will be **twelve** 10-minute quizzes as well as **two** midterm exams and one final exam. The quizzes will be administered **during the recitations** every Wednesday, starting from **August 25**, with the exception of the weeks of the two midterm exams and Thanksgiving. The **two lowest** quiz scores will be dropped. The quizzes will have to be completed **on paper**, then scanned and [uploaded to Gradescope](#) linked from Blackboard. The first quiz of August 25 will be a Syllabus Quiz, testing your basic knowledge of the main rules from this syllabus.

The midterms will be given **on campus** in Exploratory Hall 4107. There will be **four** time blocks for each midterm exam, and the number of students in each time block will be limited to 20–25. No lectures will be posted on the days of the midterm exams. The time blocks are:

Midterm 1: Sunday, September 26 at **4:30pm − 6:00pm** and **6:30pm − 8:00pm** and Monday, September 27 at **4:30pm − 6:00pm** and **6:30pm − 8:00pm**.

Midterm 2: Sunday, November 7 at **4:30pm − 6:00pm** and **6:30pm − 8:00pm** and Monday, November 8 at **4:30pm − 6:00pm** and **6:30pm − 8:00pm**.

The final exam is comprehensive and cumulative. It will take place **on campus** in Lecture Hall 1 on Sunday, **December 12**, at **5:00pm − 7:00pm**.

Important:

- You are expected to **work alone** on all the tests;
- You are **not allowed** to use any book or class notes while working on the tests, unless explicitly allowed to do so;
- Performing Internet searches and communicating with one another is **strictly prohibited**;
- Use of calculators is **not permitted**.

Any deviation from these policies will be considered a **violation of the Mason Honor Code** and will be dealt with appropriately.

- **No** makeup exams or quizzes will be given;
- If you miss a test because of an illness, you **must** get a note from your doctor;
- If you have a legitimate conflict with the test dates and times, please contact the instructor as soon as possible, **do not wait until shortly before the test**;
- Unexplained missed exams and quizzes will **not be excused**.

GRADES

The course grade will be based upon the scores on the **best ten** quizzes out of 12, two midterm exams, one final exam, recitation attendance and participation, and homework.

Best 10 Quizzes out of 12 (10 points each)	100 points	20%
Two Midterm Exams (100 points each)	200 points	40%
Final Exam	150 points	30%
Recitation Attendance and Participation	50 points	10%
Total	**500 points**	**100%**

The final grade for this course will be assigned according to the following grading scale:

Total Score:	< 60	60–70	70–73	73–77	77–80	80–83	83–87	87–90	90–93	93–96	96–100
Final Grade:	**F**	**D**	**C–**	**C**	**C+**	**B–**	**B**	**B+**	**A–**	**A**	**A+**

TUTORING CENTER

The [Math Tutoring Center](#) will be offering online tutoring services to students currently enrolled in undergraduate Math courses at GMU. To access the Math Tutoring Center online you need to login to Blackboard, click on the Organizations tab, locate the Math Tutoring Center Organization and self-enroll in this organization.

Students should post their questions in Piazza in the folder corresponding to their course. Please state your questions clearly, consider uploading a PDF file that contains your questions. Tutors will be answering your questions as soon as possible, expect to receive an answer by the following business day, although there might be delays. If you received answers for your questions and need further clarifications, you can join an active Blackboard Collaborate session.

The Blackboard Collaborate sessions will be running during the weekdays.

Academic Integrity and Honor Code

On Quizzes and Exams: No help given or received. All the tests are closed notes, closed books. This means that you are not allowed to use your notes and textbooks, unless explicitly allowed to do so.

On Homework: You may work together on homework assignments, but NO COPYING. Each student must complete his or her assignments individually and independently.

Definitions, policies, and procedures relating to the Mason Honor Code can be found on the Office of Academic Integrity web page. If you are not sure whether your activities constitute an Honor Code violation, please consult the instructor **immediately**.

Disabilities

Students with disabilities who will be taking this course and may need disability-related academic accommodations should contact the Office of Disability Services **as soon as possible** to register for support services: `https://ds.gmu.edu` or at 703-993-2474.

MATH 214 SECTION DL1, FALL 2021

ELEMENTARY DIFFERENTIAL EQUATIONS: TENTATIVE SCHEDULE OF LECTURES

Based on the **11th edition** of *"Elementary Differential Equations"* by Boyce, DiPrima and Meade.

Week	Dates	Content
1.	08/23, 08/26	**1.1** Some Basic Mathematical Models; Direction Fields **1.2** Solutions of Some Differential Equations **1.3** Classification of Differential Equations
	08/25	**Syllabus Quiz**
2.	08/30, 09/02	**2.1** Linear Differential Equations; Method of Integrating Factors **2.2** Separable Differential Equations
	09/01	**Quiz 1:** covers material from Sections 1.1–1.3
3.	09/06	**Labor Day**
	09/09	**2.3** Modeling with First-Order Differential Equations
	09/08	**Quiz 2:** covers material from Sections 2.1 and 2.2
4.	09/13, 09/16	**2.4** Differences Between Linear and Nonlinear Differential Equations **2.5** Autonomous Differential Equations and Population Dynamics
	09/15	**Quiz 3:** covers material from Sections 2.3
5.	09/20, 09/23	**2.6** Exact Differential Equations and Integrating Factors **3.1** Homogeneous Differential Equations with Constant Coefficients
	09/22	**Quiz 4:** covers material from Sections 2.4 and 2.5
6.	09/26 or 09/27	**Midterm 1:** covers material from Sections 1.1–1.3 and 2.1–2.6
	09/30	**3.2** Solutions of Linear Homogeneous Equations; the Wronskian
7.	10/04, 10/07	**3.3** Complex Roots of the Characteristic Equation **3.4** Repeated Roots; Reduction of Order
	10/06	**Quiz 5:** covers material from Sections 3.1 and 3.2
8.	10/12, 10/14	**3.5** Nonhomogeneous Equations; Method of Undetermined Coefficients **3.6** Variation of Parameters
	10/13	**Quiz 6:** covers material from Sections 3.3 and 3.4

Week	Dates	Content
9.	10/18, 10/21	**4.1** General Theory of nth Order Linear Differential Equations **4.2** Homogeneous Differential Equations with Constant Coefficients
	10/20	**Quiz 7:** covers material from Sections 3.5 and 3.6
10.	10/25, 10/28	**4.3** The Method of Undetermined Coefficients **4.4** The Method of Variation of Parameters **6.1** Definition of the Laplace Transform
	10/27	**Quiz 8:** covers material from Sections 4.1 and 4.2
11.	11/01, 11/04	**6.2** Solution of Initial Value Problems **6.3** Step Functions
	11/03	**Quiz 9:** covers material from Sections 4.3, 4.4, and 6.1
6.	11/07 or 11/08	**Midterm 2:** covers material from Sections 3.1–3.6, 4.1–4.4, 6.1, and 6.2
	11/11	**6.4** Differential Equations with Discontinuous Forcing Functions
13.	11/15, 11/18	**7.1** Introduction **7.2** Matrices
	11/17	**Quiz 10:** covers material from Sections 6.3 and 6.4
14.	11/22	**7.3** Systems of Linear Algebraic Equations; Linear Independence, Eigenvalues, Eigenvectors
	11/25	**Thanksgiving Recess**
15.	11/29, 12/02	**7.4** Basic Theory of Systems of First-Order Linear Equations **7.5** Homogeneous Linear Systems with Constant Coefficients
	12/01	**Quiz 11:** covers material from Sections 7.1–7.3
	12/12	**Final Exam:** comprehensive and cumulative