MATH 2410Q: Differential Equations

Spring 2022

Basic Information:

Instructor: Anthony Rizzie, Ph.D.
Office: MONT 412
Office Hours: Wednesday classes and by request/appointment
*Please make sure to state which course/section you are in when you send emails!

Text: The *optional* textbook for the course is "A First Course in Differential Equations with Modeling Applications" by Dennis G. Zill (11^{th} edition). The textbook comes bundled with an access code for WebAssign, which we will use to complete online homework. If you have taken a Calculus course at UConn previously (1131Q, 1132Q, and/or 2110Q), then you likely already have access and don't need to do anything. If not, you can buy the bundle for $120 at the bookstore. You can also get Cengage Unlimited for $120 if you have other Cengage courses and/or don't want a physical book.

Homework: Mathematics is best learned over time and with regular practice, and a majority of this learning occurs outside of the classroom. I encourage you to try and do as much work as you can without looking at your book and notes, which will be incredibly beneficial in diagnosing what you need to practice most while studying for the quizzes/exams.

Homework will (optionally) be completed online via WebAssign, which you should access via our course in HuskyCT. There is an assignment for almost every section of the textbook that we cover, and assignments will be due on Wednesdays at 11:59 PM. The material covered in Week 1 will be due on Wednesday of Week 2, and so on. Please do not wait to start them until Wednesday night as extensions will likely not be granted, and it is easier to get answers to questions when asked earlier.

We will also occasionally do worksheets to either review and practice key ideas or to work with new concepts and applications. These problems will hopefully serve as a great resource to practice your understanding of the techniques and variety of problems, so make sure to do them and ask questions as they arise so that you don't fall behind and get overwhelmed. The worksheets will mostly be graded.

Quizzes: You should expect a weekly quiz on Fridays. These will be graded for completion, but you should take them seriously as practice. You can best prepare by looking over the class notes, homework/worksheet problems, and by working through some extra problems in the book as needed. It is important to build a skill of studying on your own if you haven't already. You will be allowed to work in groups of up to 4 people, and you will submit work in pdf format in HuskyCT.

Exams: There will be an exam for main chapters (Chapters 2, 4, 7, and 8), and the timing is indicated on the schedule. The Final Exam date and time is TBD. You are expected to be available finals week.

You will have the option to take the average your scores on the chapter exams and let that average be your score on the Final Exam. Make sure to prepare adequately for each exam, practice often, and ask questions!

If you need to reschedule an exam for any reason, please talk to the instructor immediately. If you need to reschedule the Final Exam, this must first be approved by the Dean of Students office; I am unable to reschedule without their approval.

Grading:

WebAssign Homework	10% (*0%)
Practice Worksheets	15% (*20%)
Quizzes	15% (*20%)
Chapter Exams (each)	10% (40% total)
Final Exam	20%

*You may opt to NOT do WebAssign for a grade. Instead, that 10% will be split evenly into 20% on Worksheets and 20% on Quizzes. You will then receive the higher grade of the two computations.

The grading scale used will be 92.5%+ A, 89.5-92.49 A-, 86.5-89.49 B+, 82.5-86.49 B, etc.

Academic Integrity: Please respect your work and the work of others. Cheating will be taken seriously. Examples of things that will be addressed include, but are not limited to, communicating with anyone not explicitly allowed during any quiz or exam, representing another person's work as your own (this includes copying or paraphrasing a solution from a friend, solution manual, tutor, or website), or bringing unauthorized materials to any quiz or exam. Consequences may include, but are not limited to, a score of zero on the assignment, quiz, or exam, or a grade of F in the course. To read UConn's full policy on Academic Integrity, visit community.uconn.edu/the-student-code-appendix-a/.

How to Succeed in This Course: You should attend each class meeting and complete all assignments. It would be best to read through the material before the week begins to get an idea of what we will cover (see course schedule). This will help you to follow the topics and ideas more closely and ask questions that will better help you to understand the concepts and mechanics. I cannot stress enough the importance of practicing mathematics regularly.

Attendance: As previously stated, you should plan to attend every meeting of this course. This course covers a lot of material, and you are expected to do an appropriate amount of work outside of class, which will probably consist of more practice than just the problems on the homework assignments and worksheets. There will be ample opportunities for questions and review, which are designed to lessen the burden of work outside of the classroom and give you a chance to ask questions as you come across them and work closely with me and other students.

Late Work Policy: You are responsible for any material that you miss. Any work that is due on a day that you are absent is still due and will be considered late if turned in at a later time. There will be no makeup quizzes. Late work will not be accepted or graded unless you contact the instructor about it.

Grading Policy: Your worksheets, quizzes, and exams will be returned to you in a timely manner, usually within a few days of when they are due. If there are any issues, please talk to me to resolve it.

Extra Credit: There is no extra credit in this course, so please do not ask. Make sure to study and be prepared; it is easier to be proactive than reactive.

Calculators: Calculators are permitted and encouraged for homework. You will not need a calculator for any of the quizzes or exams.

Course Outline: (this is tentative and could change)
(*) indicates a week with one or more worksheets

Week	Week of	Topic(s) Covered
1	1/17	1.1 Definitions and Terminology 1.2 Initial-Value Problems 1.3 Differential Equations as Mathematical Models (No WebAssign)
2*	1/24	2.1 Solution Curves without a Solution 2.2 Separable Equations
3	1/31	2.3 Linear Equations 2.4 Exact Equations
4*	2/7	2.5 Solutions by Substitutions 2.6 A Numerical Method (Euler's Method)
5*	2/14	3.1 Linear Models 3.2 Nonlinear Models 3.3 Modeling with Systems of First-Order Equations (No WebAssign) **Chapter 2 Exam (Fri, 2/18) Covers 1.1, 2.1-2.6**
6	2/21	4.1 Preliminary Theory-Linear Equations 4.2 Reduction of Order (No WebAssign) 4.3 Homogeneous Linear Equations with Constant Coefficients
7	2/28	4.4 Undetermined Coefficients- Superposition Approach 4.6 Variation of Parameters
8*	3/7	Review Nonhomogeneous Equations (4.4 and 4.6) **Chapter 4 Exam (Fri, 3/11) Covers 4.1-4.4, 4.6**
	3/14	**SPRING BREAK, NO CLASS**
9	3/21	5.1 Linear Models: Initial-Value Problems (No WebAssign) 7.1 Definition of the Laplace Transform
10	3/28	7.2 Inverse Transforms and Transforms of Derivatives 7.3 Operational Properties I (Translation on t- or s-axes)
11*	4/4	7.4 Operational Properties II (Derivatives, Convolution, Periodic Functions) **Chapter 7 Exam (Fri, 4/8) Covers 7.1-7.4**
12*	4/11	B.1 Basic Definitions and Theory B.2 Gaussian and Gauss-Jordan Elimination B.3 The Eigenvalue Problem
13	4/18	8.1 Preliminary Theory- Linear Systems 8.2 Homogeneous Linear Systems
14*	4/25	Additional Notes: Plotting Phase Portraits **Chapter 8 Exam (Wed, 4/27) Covers 8.1-8.2, Phase Portraits** Review for Final Exam
	5/2	**Final Exam Week, Date and Time TBD**