

Instructor: Dr. Chris Lee clee@roanoke.edu Trexler 270D

Student Hours: Have a question? Please stop by my office to chat. Regular student hours are listed below, and I welcome you to contact me to make an appointment outside of these hours:

Mon: 2:30-3:30pm, Tue: 1:00-2:00pm, Wed: 2:30-3:30pm.

Course Objectives: Very few real-world problems arise in a form that has already been solved. This course will focus on the use of a transformation to reduce a difficult problem into smaller, hopefully solvable components, and then reconstructing the entire solution. While being very technical and sometimes messy, the material in this course can be applied to a wide variety of phenomena, and we will look at a number of these applications.

Learning Outcomes: By the end of this course, successful students will be able to:

- Apply their knowledge of differential equations to real-world phenomena.
- Compare the many different techniques available for solving partial differential equations – most importantly determining which is appropriate for a given problem.
- Utilize technology to both find and visualize solutions to differential equation problems.

Required Materials:

Textbook: Boyce and DiPrima, *Elementary Differential Equations and Boundary Value Problems*, 11th Edition.

Lab Technology: Laptop with *Mathematica* installed

Attendance: Come to class and be prepared to actively participate - this is the best way for you to engage in the learning material and it makes our class meeting so much more fun! You should attend every class, but extenuating circumstances can arise that can make this difficult. If you cannot attend a class, please let me know. If circumstances cause you to miss more than 3 classes during the semester, you may be overextended and should consider dropping the class.

Reading and Participation: Key to learning is participation. We will strive to have an active, rather than passive, classroom environment. On Inquire is a day-by-day outline of the chapters that will be discussed in class. I fully hope that you will have read the upcoming chapter before the class meeting. You most certainly will not understand everything while you are reading ahead, but having read the section will allow you to ask questions and follow along better in class.

Late & Missed Work: Unfortunately, illnesses, death in the family, or other traumatic events are part of life. Such events are unwelcome and because I understand how difficult these times are, if you contact me within 24 hours of the event and provide documentation I will be happy to extend deadlines and/or provide make-up work.

Expected Hours of Work: To be successful in this course it is anticipated that you will put in at least 12 hours of work inside and outside of class each week.

Academic Integrity: Students are expected to follow the integrity policy detailed in the handbook *Academic Integrity at Roanoke College*. Additionally, if you are ever uncertain as to how the College's policy pertains to any assignment or exam in this course, please ask me for clarification. The bottom line is that all work that a student submits for a grade must be **solely** the work of that student unless the instructor has given explicit permission for students to work together.

Retrieval Practice: A clear and most important goal of this course is to give you an exposure to and understanding of calculus. There is a large difference between the intake of course information, and the retrieval of such information. And, shown by study after study, if you wish to be able to retrieve information you must PRACTICE retrieving information. To aid in this retrieval practice there are a variety of assessment activities throughout the term, the goal being higher frequency with less weight on any particular event. You will encounter:

- Weekly Reflection Videos: On most Tuesdays throughout the semester you will be submitting short video reflections of the happening of the course the prior week. You will be showing your HW problems, demonstrating understanding of concepts vs. simple memorization, or addressing a different specific prompt for that week. These MUST be done using the (free) software Loom with links shared through the assignment on our Inquire page.
- Testing: There are three tests and a final exam.

Everything is Cumulative: You will find that virtually every day in class we will be combining information from previous chapters with material we are currently studying, and this pattern will carry over to all your graded work. I am committed to helping you put together a large course basket of knowledge this semester and to giving you frequent opportunities to practice retrieval of this knowledge. To that end, all quizzes, tests, and the final exam are cumulative. On any one of these approximately 50% of the assessment will be on fundamentals of previous material and 50% on new material.

Course Grade: Components of a student's grade will be weighted as follows:

Tests: 45% Quizzes: 20% Video Reflections: 20% Final Exam: 15%

A scale will for final grades will not be lower than the scale given below.

0	60	63	67	70	73	77	80	83	87	90	93
F	D-	D	D+	C-	C	C+	B-	B	B+	A-	A