

Northern Arizona University  
College of the Environment, Forestry, and Natural Sciences  
Department of Mathematics and Statistics

## MAT 239 (Differential Equations) Syllabus

Fall 2020, 3 Credit Hours

Section 1 (2358) MWF 9:10-10:00 in AMB 205

Section 7 (6921) MWF 10:20-11:10 in AMB 205

### *Instructor Information*

**Instructor:** Jim.Swift@NAU.edu AMB 110 523-6878 [www.nau.edu/Jim.Swift](http://www.nau.edu/Jim.Swift)

**Office Hours:** Tues 10:30-11:40, Wed 3:00-4:30, Th 3:00-4:30. By “office hours”, I mean that I will be available for individual zoom meetings by appointment. I will not schedule other things at these times. If these times are inconvenient, you can make an appointment at some other time. E-mail is the best way to contact me. I will check my e-mail after 9:00pm on nights before a WeBWorK assignment is due, and reply that night.

### *Course Description*

**Text:** *Elementary Differential Equations* 10th edition, by Boyce and DiPrima. This text is optional, and an older (or newer) edition is almost as good as the 10th. No homework will be assigned from the text. Most or all of the homework will be on WeBWorK. A link to Paul Dawkins’ notes is on the web site.

**Prerequisite:** A grade of C or better in MAT 238 or current registration in MAT 238. You are responsible for making sure that you have met this prerequisite.

**Content/Outline:** Solutions of first-order differential equations, second and higher order linear equations, systems of linear differential equations, series solutions, numerical solutions of differential equations (chapters 1-5 and 7 of the text, with some skipped sections).

**Student Learning Outcomes:** Students will learn how to solve first order differential equations that are linear or have some other special form. Students will learn how to solve linear differential equations with constant coefficients. Students will learn how to use differential equations to model physical systems. There are many differential equations that nobody can solve. Students will learn a few methods of finding approximate solutions to these differential equations which cannot be solved exactly.

**Course Structure/Approach** The class will use lecture-discussion-group work format.

### *Assessment of Student Learning Outcomes*

**Points:** There will be approximately 520 possible “class points.” All class points are assigned with the scale A (90%), B (80%), C (70%), and D (60%). The timeline for assessment is simple; whenever *class points* are assigned, they they are fully “curved” and will not change further. So at any point students can calculate the fraction of the possible class points obtained so far to determine their current grade.

**Attendance and quizzes** (about 100 points)

**Midterms:** (2 or  $3 \times 100 = 200$  or 300 class points) There will be 2 or 3 midterm exams. Each exam will have a raw score and a “curved” or scaled score based on 100 possible class points. Calculators are not allowed at the midterm exams or the final exam.

**Homework:** (17 or  $18 \times 10 = 170$  or 180 class points) We will be using WeBWorK for most of the homework assignments, but there may be some homework assigned from the textbook or other homework. Each of WeBWorK sets is worth 10 class points. The point value of the paper assignments will be announced when they are assigned.

**Final Exam:** (150 class points) The Final Exam will be comprehensive. The final exam is scheduled for Monday, 11/23, 7:30am-9:30 (9:10 class) and Friday, 11/20, 10:00-12:00 (10:20 class).

I reserve the right to raise your course grade from the 90/80/70 curve, based on an exceptional final exam.

**Extra Credit:** At each midterm exam I will give you 3 points if you had no unexcused absences since the previous exam. I give extra credit for the math department’s “Problem of the Week” as described on the website

### *Course Policies*

**Zoom:** Our classes will be held synchronously via zoom, and possibly we will have one third of the students in classroom for each class later in the semester. It’s best to use a laptop rather than a phone for the classes, since looking materials posted to the web site and doing webwork on the web, and connecting to BbLearn will be done during class. I will expect students to be muted with their cameras on. I will have the chat available, but I won’t be able to monitor it closely. If you have a question or comment, you can just unmute yourself and call out to me. The classes will be recorded and I will put links to the recordings on BbLearn. Please do not share anything from these recordings with anyone outside the class. There is a link below to “covid’ policies” Calculators are not allowed at the exams.

**Late Homework:** I can delay your individual due date for WeBWorK assignments. I will handle requests on a case-by-case basis, but you must contact me before the due date since the answers are made available at that time.

**Missed Class Days:** I will allow excused absences, for extra credit purposes, for institutional excuses, illness, or other reasons that I approve. Please notify me of an absence by e-mail or voice mail *before* class if possible. Furthermore, if you are late and I take roll before you arrive, then you will be counted absent.

**Makeup Exams:** A similar policy to “Missed Class Days” holds. I will give a makeup exam for illness or other emergencies. Please notify me that you will miss an exam by e-mail or voice mail *before* the exam if possible.

**Academic Honesty:** We will discuss academic honesty when we get closer to the exams.

**University and Departmental Policies:** Our class web site has these links.

<https://www.nau.edu/Jim.Swift/classes/MathDepartmentPolicies.pdf>

<https://nau.edu/University-Policies/>

<https://nau.edu/wp-content/uploads/sites/26/Syllabus-Policy-Statements.pdf>

**Amendments:** Any changes to this syllabus will be announced in class, and the updated version will be posted on my website. This version: August 11, 2020.