

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

## **MAT 137 (Calculus II) Syllabus for Fall 2023**

Section 003, Class 3626, 10:20-11:10 MTuWF, in AMB 220

Section 005, Class 3702, 1:50-2:40 MTuWF, in AMB 163

### *Instructor Information*

**Instructor:** Jim Swift    Jim.Swift@NAU.edu    AMB 110    523-6878 (voice mail)

**Office Hours:** M Tu W F: 11:30-12:40, Tu: 3:00-3:50

If these times are inconvenient, you can make an appointment, or drop by my office any time. E-mail is always a good way to contact me. If you send me email before 9:00pm on nights a WeBWorK assignment is due, I will reply that night.

**Websites:** Our class website is [ac.nau.edu/~jws8/classes/137.2023.7/](http://ac.nau.edu/~jws8/classes/137.2023.7/). I use the class web site for most electronic communication. I use Canvas for grades and for posting documents, like practice exams and scanned solutions, that I don't want the world to see.

**Text:** There is no book to buy. Canvas and our website have links to free resources.

**Prerequisite:** A grade of C or better in MAT 136, or satisfactory placement by the Department of Mathematics and Statistics.

### *Assessment of Student Learning Outcomes*

**Points:** There will be approximately 678 “class points” possible. 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 are fully “curved” and will not change further. So at any point students can calculate the fraction of the assigned class points to determine their current grade.

**Midterms:**  $\approx 44\%$  of grade ( $3 \times 100 = 300$  class points) Each exam will have a raw score and a “curved” or scaled score based on 100 possible class points. You may not bring calculators or formula sheets to the exam. A formula sheet will be supplied on some exams. In fairness to those with classes before or after ours, the exams will start and end on time.

**WeBWorK:**  $\approx 20\%$  of grade (approximately  $23 \times 6 = 138$  class points) We will be using WeBWorK for most of the homework assignments. Each WeBWorK assignments is worth 6 class points. The class points are assigned with no curve; for example a WeBWorK score is 8 out of 16 earns 3 out of 6 class points.

**Quizzes:**  $\approx 6\%$  of grade ( $8 \times 5 = 40$  class points) Almost every day we will have a worksheet posted on the web site. Usually you will do this on your own paper, we will go over the solutions in class, and it will not be graded. On most Fridays that are not exam days, the worksheet will be a 5 point quiz that I will hand out on a half sheet of paper. You will turn the quiz in for grading. There might be other written assignments beyond the quizzes.

**Final Exam:**  $\approx 29\%$  of grade (200 class points) The Final Exam will be comprehensive. The final exam is scheduled at

- Monday, December 11, 10:00-12:00 (10:20 class)
- Tuesday, December 12, 12:30-2:30 (1:50 class)

**Attendance:** (6 extra credit class points for perfect attendance, down to 35 points deducted for never showing up) Attendance is mandatory, and will be recorded for every class period. At each of the 3 midterms, the students will receive an attendance score equal to 2 minus the number of unexcused absences since the previous exam. That is, you get 2 class points of extra credit at each exam, but you lose one point for every class you miss.

**Extra credit:** There are other extra credit opportunities. For example, extra credit will be given for the departmental “Problem of the Week.”

### *Course Content*

**Content and Course Objectives:** MAT 137 is a four credit hour course that meets 200 minutes each week. The course continues the study of calculus with emphasis on techniques of integration, applications of integration, differential equations, sequences and series, parametric equations, and polar coordinates.

**Student Learning Outcomes:** Upon completion of the course, students will be able to integrate functions using simple techniques, and find the value of definite integrals. They should be able to apply that knowledge to solve problems in geometry and simple physics, for example computing volumes of solids revolution or mechanical work done. They will be able to solve simple first order differential equations either analytically or numerically (with Euler’s method) and apply the ideas of differential equations to compartmental analysis, falling bodies and a number of other situations. They will understand what it means for an infinite series to converge and be able to apply a number of tests to determine if the series converges or diverges. They will understand how to describe curves with parametric equations, and be able to convert between polar and rectangular coordinates in the plane.

**Course Structure** The class will mostly use lecture-discussion format. In-class worksheets will be frequently used, and some worksheets will be graded quizzes. Students will apply what they have learned to solve homework problems on WeBWork.

**Course Outline:** We will cover the following topics (in order)

Techniques of Integration (Midterm 1)

Applications of Integration, and Differential Equations (Midterm 2)

Sequences and Series (Midterm 3)

Parametric Equations and Polar Coordinates (only on the Final Exam)

### *Course Policies*

**Calculators:** No calculators are allowed at the exams. You may bring a calculator to class on non-exam days.

**Laptops and Tablets:** These are not allowed at exams, but you may bring them to class to take notes or do WeBWorK. No facebook, etc., please! You can download the pdfs of the worksheets to your tablet, and work the problems with your stylus. Similarly, you can download pdfs of the webwork assignments and work the problems on your tablet.

**MAP Room and Computer Lab:** The Mathematics Achievement Program room, AMB 137, is a great resource. It has tutoring available starting Wednesday, August 30, and a few computers. The departmental computer lab, in AMB 222, is available for your use when it is open. One of the PMAs who works in the MAP room, Maddy Cox, will be “embedded” in our classroom Mondays and Wednesdays. She will help students with the worksheets and provide other support. Get to know her.

**Excused Absences:** If you have an institutional excuse, you will not lose the attendance extra credit. If you are sick, or feel you deserve an excused absence for some other reason contact me by e-mail, phone, or in person. Do so before the absence, if possible. Makeup exams will be given only in extenuating circumstances. Please contact me before an exam if you must miss it.

**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 by 9:00 pm on the due date since the answers are made available at 11:59 pm that night.

**Commitment:** This course is difficult and it moves quickly. You should be committed to working an average of at least two hours a day, six days a week, outside of class. Regular homework and regular attendance is expected.

**Help:** If you need help the first person to contact is me. I am your personal tutor at no charge. You can come to my office hours or contact me via e-mail. There is a button in WeBWorK for sending me e-mail. The Student Learning Centers have an array of free services, including drop-in or personal tutoring, and the MAP room, AMB 137.

**Generative AI and the Internet** This is a general policy statement, that might become the official Math/Stat departmental policy.

Since mathematical reasoning, problem solving, and critical thinking skills are part of the learning outcomes of this course, all assignments should be prepared by the student. Developing strong competencies in this area will prepare you for a competitive workplace. You may not submit assignments as your own work that directly copy all or a major part of the results of using ChatGPT or AI mathematics assistive technologies (e.g. Wolfram Alpha, PhotoMath, etc.). Such AI-generated submissions are not permitted and will be treated as plagiarism.

AI tools like ChatGPT may be permitted by the instructor to be used in a limited or indirect fashion for a particular type of assignment. In that case the AI tools should be used with caution and proper citation. AI is not a replacement for your own thinking and research. Over reliance on AI tools beyond that explicitly allowed is a violation of the departmental honor and ethics code. Any use of AI tools on quizzes and exams is expressly forbidden.

**Academic Honesty** Cheating on exams will not be tolerated, and procedures for reporting cheating to the university will be followed.

**Suggestions:** Try to do the webwork problems on your own. Keep an orderly journal with the problem number clearly indicated so you can refer to it. Do the work clearly so you can correct your mistakes. If you get stuck on a problem it is OK to look on the internet for help. But remember, there is no internet, no ChatGPT, “no nothing” allowed on tests. A sure way to fail this course is to have the internet do your webwork for you. Another way to fail the course is to skip many of the webwork assignments.

Another suggestion is to study the in-class worksheets until you understand them deeply. These problems are more in the style of exam questions than the WeBWorK problems are.

**University and Departmental Policies:** The web site has links to University and Departmental Policies.

**Amendments:** Any changes to this syllabus will be announced in class, and an updated version will be posted on my website. This version: August 28, 2023