

“The greatest shortcoming of the human race is our inability to understand the exponential function.”

-Al Bartlett

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Office: Deady 11a (Basement floor)
Office Hours: MWTh 1-2, F 12-1 (Or by appointment)
Class Location: Fenton 105
Time: MTWTh 10-11:50am

Course Description: This course will survey several topics in mathematics, including applied geometry, finance math, exponential and logarithmic equations, and time-permitting, matrices and Markov chains. Emphasis will be placed on mathematical modeling and the development of mathematical writing skills.

Required Text: *Mathematics: A Practical Odyssey*, 7th ed. Johnson and Mowry, **OR** *University Math I and II, Math 105/106*, 3rd ed. (These are the same textbook). Note that there are a few copies of the textbook available in the Knight Library and the Mathematics Library.

Technology: A scientific or graphing calculator is required for exams and homework. Calculators may be checked out from the Math Office in Fenton Hall and the UO Library system. No other electronic devices may be used during exams.

Intensive Learning Format: This course is taught in an intensive learning format. In four weeks, we will cover the same amount of material that is covered in a typical 11-week course. A prepared student will attend class for two hours per day, and spend about three hours per day on work outside the classroom (reading, doing homework, discussing, studying, etc.). Together, this represents a 25-hour per week commitment. Having additional classes, day-time family obligations, or work during this time will seriously hinder your potential for success.

Course Outcomes

By the end of the course, a student should be able to:

1. Compute perimeter and area of common and combinations of common two-dimensional figures.
2. Calculate the volume and surface area of common three-dimensional figures.
3. Use similar triangles to find unknown side lengths of triangles.
4. Apply the Pythagorean Theorem to find an unknown side length of a right triangle.
5. Determine and interpret the significance of the foci of ellipses and hyperbolas in context.
6. Compare the results of simple and compound interest investments.
7. Find the unknown payment, interest rate, or length of investment of an interest-bearing lump sum- or annuity-funded account.
8. Solve for the unknown payment or loan amount of a simple interest amortized loan or payout annuity.
9. Describe the difference between a nominal loan rate and the APR.
10. Use basic properties of exponents and logarithms to simplify exponential and logarithmic expressions.
11. Solve exponential equations and logarithmic equations in applied contexts.
12. Develop exponential growth and decay models from two data points.
13. Make predications using exponential models and compute average rate of change.
14. Compute products of 2x2 and 3x3 matrices.
15. Create probability and transition matrices, and use them to make predictions.
16. Solve a system of two linear equations.
17. Find equilibrium matrices and use them to analyze long-term trends.

Grading Criteria

Your grade in the class will be based on the following rubric:

1	Homework	22%
2	Daily Quizzes	12%
3	Exams (3)	66% (22% each)

1 Homework

The best way to improve mathematical skills is through regular practice. Homework will be assigned daily and will be due twice weekly on paper at the start of class (usually on Tuesdays and Fridays). Some exercises will be graded on accuracy, while others on completion. In all cases, work must be shown in order to earn credit. Over the term, you may request an extension on 1 assignment. Except in extreme circumstances, no other extension will be given.

2 Daily Quizzes

At the start of each class, a short quiz will be given on the main topics from the previous day's lecture. These quizzes are intended to give me feedback about the lecture, assess participation, and allow you to reflect on your understanding of the material. Quizzes will be graded out of 10 points according to the following scale: 7 points will be given for completing the quiz, while the remaining points will be earned for accurately completing the problems. No make-up quizzes will be given, but at the end of the term, your lowest two daily quiz scores will be dropped.

3 Exams

Three non-cumulative exams will be given in class over the course of the term. The first is scheduled for Tuesday, July 28th (chapter 8), the second for Wednesday, August 4th (Chapter 5) and the third for Thursday, August 13^h (Chapters 10, 11). Note that the first two exams will be given during class, while the third will be given during the final exam period (8am-10am). If you anticipate that you will miss an exam, you must notify me at least 5 days in advance so that alternate arrangements can be made. Except in extreme circumstances, no other make-up exams will be given.

Expectations: Regular attendance and judicious note taking is essential for your success in this course. I would highly encourage you to collaborate with your classmates on homework and in preparation for exams; however, all students must individually submit their own assignment. If you miss a class, you are responsible to learn the missed material independently. If you would like additional assistance, feel free to stop by my temporary office in Deady 11a. If you need to meet at a time other than the listed office hours, send me an email so that we can try to find a time that will work around both of our schedules. To obtain a passing grade in this course, extensive study outside the classroom is necessary.

Communication: If you would like to contact me, I can most easily be reached by email (wells6@uoregon.edu) weekdays between 10am and 6pm. While I will try to answer email as soon as is possible, in some cases, I may not be able to respond until the following school day (In particular, emails after 6pm likely won't be answered until after class the next day). When emailing in regards to homework problems, be explicit about the work you have already attempted on the problem, and include specific question questions about what you do not understand. Simply writing that you "do not know what to do / where to begin" does not give me enough information to help, and might indicate that it would be best to meet in person.

Accessibility

Any student with a disability for whom special accommodations would be helpful is encouraged to discuss this with the instructor as soon as possible. If you are currently registered with the Accessible Education Center, please present your paperwork to me during the first week so that we can design a plan for you.

Academic Integrity

Students are allowed, and in fact, encouraged, to collaborate on homework assignments. However, the work that you turn in must be your own. Exams will be closed book, closed notes, closed colleague, unless otherwise specified. All written work that references material outside of the textbook should be accompanied by an appropriate citation (APA or AMS format is preferred). The University of Oregon requires that all instances of academic dishonesty be reported, no matter the scope.

Approximate Schedule

Week	Sections	Notes
I	8.1, 8.2, 8.4, 8.5, 8.7	
II	5.1 – 5.5	Exam 1 Tuesday
III	5.6, 10.1 – 10.3, 11.0	Exam 2 Wednesday
IV	11.1, 11.2	Exam 3 Thursday 8am-10am