

Math 101: Foundations of Algebra and Mathematical Modeling

Text and Required Materials:

- (1) *Foundations of Algebra and Mathematical Modeling*, University of Oregon (free on Canvas)
- (2) Procedural Work Program:

Instructors may choose between ALeKS or Webwork or their class. ALeKS is a full program that includes videos and assistance. Webwork is a free electronic homework system without any videos or lessons.

Important: Whatever program you choose, students must pass the procedural work with 85% as one criteria for passing the course.

- (3) A Scientific, **NON-Graphing** Calculator
- (4) A Desmos or Geogebra student account (if your class is doing Desmos or Geogebra)
- (5) Access to Canvas with a browser updated enough to take quizzes

Learning Environment: The University of Oregon strives for inclusive learning environments. Please notify me if the instruction or design of this course results in disability-related barriers to your participation. You are also encouraged to contact the **Accessible Education Center** in 164 Oregon Hall at 541-346-1155 or uoac@uoregon.edu.

Course Description: Critical elements of pre-college algebra, topics including equation solving; rational, radical, exponential, and polynomial expression evaluation and simplification; lines, linear equations, quadratic equations, and exponential equations. Focus on mathematical modeling and preparation for additional college level mathematics.

This class will be done remotely this term. There is likely to be a lot of trial and error as we work this through. Circumstances may occur that may require changes to content or structure of the course. For this reason, consider this syllabus a tentative syllabus.

Learning Objectives: Provided at the end of this syllabus. They make a great study tool so keep them as a reference.

Classroom Policy, Procedure, and Expectations: Students are expected to take responsibility for their own learning and progress. In general, this includes being aware of university policies and deadlines as well as specific policies, due dates, and exam dates.

Course Structure:

- (1) Each lecture will have likely have pre-work. A lot of the pre-work is done on Desmos or Geogebra.
- (2) If you can't make class: You can and are expected to earn back participation credit by completing the missed in class work. This work may be on Desmos, Geogebra, or on paper.
- (3) Take notes while in work. Have a notebook and make sure you are writing the main ideas, topics, and any errors you may make.
- (4) Check-in assessments will take place on Fridays.
- (5) Post-work, procedural work, worksheets, activities, and other work are completed outside of class and usually are due on Fridays.

Workload: In general, students in a 4 credit course spend an average of 8 hours per week on assignments and study outside of class, in addition to the 4 weekly class meeting hours.

Adaptive Homework: Homework in the ALEKS adaptive online system or on Webwork will be regularly completed by students. Assignments will be due once a week (usually Friday by 11:59 pm.) The adaptive homework system will allow students to focus on the areas where they are struggling, and the software will provide assistance in these areas.

You can purchase ALeKS at this link: <https://uoduckstore.redshelf.com/item/23636>

In Class Work and Participation: This is where a lot of the learning takes place. If you miss a class you are expected to make it up by completing the work on your own and turning that in.

Assessments: Check-in knowledge checks are every Friday except when there are exams.

Out of Class Assignments: Post-work, pre-work, worksheets, reading quizzes, completing in class work, and other assignments will be assigned throughout the week. I usually have this material due on Friday by 11:59 p.m.

Projects: One or two multi-page written assignments will be assigned in the term. Two are assigned most terms. Given the situation this year, one may be appropriate. These projects will take a significant amount of time and should be started early. Projects should show strong effort, communication skills, and organization.

Exams: There are two midterms and a final exam in this class. Most likely students will not be allowed to use books, notes, or any outside assistance on exams. Non-graphing calculators may be allowed on exams. Details will be announced for each exam. **Your cameras may be required to be on to receive any credit on the exam**

Assessment and Grades: Instructors may use their own grading schemes but adaptive homework must be 10%. This is my scheme:

Adaptive Homework	10%
Projects	5%
Homework: Worksheets/Activities/Participation/Pework	20%
Quizzes, Study Quizzes	5%
Midterms	30%
Final Exam	30%

IMPORTANT NOTE! In order to pass this class, students must meet three requirements:

- An overall passing grade.
- A grade of at least 85% on the procedural homework.
- A passing average for the exams, as determine by the instructor.

If you do not meet these three requirements, the highest grade you can get is a D+.

Tentative Weekly Schedule: The following is a non-binding notion of where we will be and what we will do each week. The actual assignment deadlines will be provided in class and usually also on Canvas.

Note: For space consideration, the abbreviation “AHW” means “Adaptive Homework”.

Week	Class Time Agenda	Procedural Work
1	Linear equations of the form $y = mx$, Linear equations,	AHW #1 due
2	Applications, Piece-Wise, Regression	AHW #2 due
3	Average Cost, Systems of Linear Equations	AHW #3 due
4	More Applications, Review	AHW #4, Exam #1
5		AHW #5 due, Project #1 due
6	Exponential Equations and Regression	AHW #6 due;
7	More Exponential, Linear vs. Exponential	AHW #7 due, Exam #2 due
8	Review, Other Functions	AHW #8 due Project #2 due
9	More Other Functions, Comparing Functions	Finish all AHW
10	Catch-up, Review	
11	Final Exam, At assigned combined final time TBA	

Class Encore assistants will hold virtual office hours that all Math 101 students are welcome to attend and a learning assistant will take place in our class.. Students may drop in to their LA or instructor’s office hours without an appointment to ask questions.

Academic Conduct: The code of student conduct and community standards is at dos.uoregon.edu/conduct.

In this course, it is appropriate to help each other on homework as long as the work you are submitting is your own and you understand it. It is not appropriate to help each other on exams, to look at other students exams, or to bring unauthorized material to exams.

The University Student Conduct Code (available at conduct.uoregon.edu) defines academic misconduct. Students are prohibited from committing or attempting to commit any act that constitutes academic misconduct. By way of example, students should not give or receive (or attempt to give or receive) unauthorized help on assignments or examinations without express permission from the instructor. Students should properly acknowledge and document all sources of information (e.g. quotations, paraphrases, ideas) and use only the sources and resources authorized by the instructor. If there is any question about whether an act constitutes academic misconduct, it is the students' obligation to clarify the question with the instructor before committing or attempting to commit the act. Additional information about a common form of academic misconduct, plagiarism, is available at [https://researchguides.uoregon.edu/citing-plagiarism.?](https://researchguides.uoregon.edu/citing-plagiarism.)

Important notes:

- In the event of a campus emergency that disrupts academic activities, course requirements, deadlines, and grading percentages are subject to change. Information about changes in this course will be communicated as soon as possible by email, and on Canvas. If we are not able to meet face-to-face, students should immediately log onto Canvas and read any announcements and/or access alternative assignments. Students are also expected to continue coursework as outlined in this syllabus or other instructions on Canvas.

In the event that the instructor of this course has to quarantine, this course may be taught online during that time.

- Inclement Weather

It is generally expected that class will meet unless the University is officially closed for inclement weather. If it becomes necessary to cancel class while the University remains open, this will be announced on Canvas and by email. Updates on inclement weather and closure are also communicated in other ways described here: <https://hr.uoregon.edu/about-hr/campus-notifications/inclement-weather/inclement-weather-immediate-updates>

- Basic Needs

Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live and believes this may affect their performance in the course is urged to contact the Dean of Students Office (346-3216, 164 Oregon Hall) for support.

This UO webpage includes resources for food, housing, healthcare, childcare, transportation, technology, finances, and legal support: <https://blogs.uoregon.edu/basicneeds/food/>

- As the University of Oregon returns to in-person instruction, the key to keeping our community healthy and safe involves prevention, containment, and support. **Here is information critical to how the UO is responding to COVID-19.**

Prevention: To prevent or reduce the spread of COVID-19 in classrooms and on campus, all students and employees: Must to be comply with vaccination policy

Must wear face coverings in all indoor spaces on UO campus

Complete weekly testing if not fully vaccinated or exempted

Wash hands frequently and practice social distancing when possible

Complete daily self-checks

Stay home/do not come to campus if feeling symptomatic

Complete the UO COVID-19 case and contact reporting form if you test positive or have been in close contact with a confirmed or presumptive case.

Containment: If a student in class tests positive for COVID-19, all relevant classes will be notified via an email by the Corona Corps Care Team with instructions for students and staff based on their vaccination status.

Specifically: Vaccinated and Asymptomatic students: Quarantine not required, but daily self-monitoring before coming on campus is advised; sign up for testing through MAP 3-5 days after exposure if advised you are a contact.?

Unvaccinated or partially vaccinated students: 14-day quarantine advised ? do not come to class ? and sign up for testing 3-5 days after notification through MAP, if asymptomatic, or through University Health Services (541-346-2770) or your primary care provider, if symptomatic.

Symptomatic students: stay home (do not come to class/campus), complete the online case and contact form, and contact University Health Services (541-346-2770) or your primary care provide to arrange for immediate COVID-19 testing. Students identified as a close contacts of a positive case will be contacted by the Corona Corps Care Team (541-346-2292).

Support: The following resources are available to you as a student.

University Health Services or call (541) 346-2770

University Counseling Center or call (541) 346-3277 or (541) 346-3227 (after hrs.)

MAP Covid-19 Testing

Corona Corps or call (541) 346-2292

Academic Advising or call (541) 346-3211

Dean of Students or call (541)-346-3216

Good Classroom Citizenship

Wear your mask and make sure it fits you well

Stay home if you're sick

Get to know your neighbors in class, and let them know if you test positive

Get tested regularly

Watch for signs and symptoms with the daily symptom self-check

Wash your hands frequently or use hand sanitizer

Complete the UO COVID-19 case and contact reporting form if you test positive or are a close contact of someone who tests positive.

- Accommodation for Religious Observances

The university makes reasonable accommodations, upon request, for students who are unable to attend a class for religious obligations or observance reasons, in accordance with the university discrimination policy which says "Any student who, because of religious beliefs, is unable to attend classes on a particular day shall be excused from attendance requirements and from any examination or other assignment on that day. The student shall make up the examination or other assignment missed because of the absence." To request accommodations for this course for religious observance, visit the Office of the Registrar's website (<https://registrar.uoregon.edu/calendars/religious-observances>) and complete and submit to the instructor the "Student Religious Accommodation Request" form prior to the end of the second week of the term.

- For information about my reporting obligations as an employee, please see Employee Reporting Obligations on the Office of Investigations and Civil Rights Compliance (OICRC) website. Students experiencing any form of prohibited discrimination or harassment, including sex or gender-based violence, may seek information and resources at safe.uoregon.edu, respect.uoregon.edu, or investigations.uoregon.edu or contact the non-confidential Title IX office/Office of Civil Rights Compliance (541-346-3123), or Dean of Students offices (541-346-3216), or call the 24-7 hotline 541-346-SAFE for help. I am also a mandatory reporter of child abuse. Please find more information at Mandatory Reporting of Child Abuse and Neglect.

Learning Objectives: A successful student should be able to succeed at an exam which focuses on the major objectives and contains a lesser focus on supporting objectives (in particular, drawing upon these for applied exercises).

Major Objectives – These objectives are priority targets on each summative exam subsequent to the introduction of that material. They include that a successful student can...

- (1) simplify and evaluate algebraic expressions
- (2) solve and simplify linear equations in one or two variables
- (3) interpret a point on a graph (esp. a line) in the context of a word problem
- (4) interpret constants in the equation of a line in the context of a word problem
- (5) graph linear equations in two variables
- (6) determine the intercepts of a given line whether from a graph, table, or equation
- (7) solve systems of equations
- (8) set up and solve a variety of real-world problems based on exponential equations, linear equations or systems of equations (using substitution)
- (9) manipulate exponential expressions
- (10) solve quadratic equations of the form $x^2 + bx + c = 0$ and $a(x - h)^2 + k = 0$ exactly
- (11) model formulas for functions by finding values of parameters, given data
- (12) determine from a table, graph, or equation whether or not a relationship between two variables is linear or exponential
- (13) write an equation defining a relationship between variables in a piecewise manner
- (14) interpret the result of mathematical processes in a non-mathematical context
- (15) express written descriptions between variables as the graph, table, or formula for that relationship.
- (16) estimate trend lines for linear and exponential regression. Interpret the residual at a given point.
- (17) successfully use technology such as Excel, Google Sheets, Desmos, and/or WolframAlpha in application to the objectives

Supporting Objectives – These objectives may be present on individual assessments, but may not be included in all summative exams. They include that a successful student can...

- (1) factor quadratic and other polynomial equations using the greatest common factor
- (2) identify solutions to systems of equation as either a line, a point, or no intersection (parallel lines)

- (3) perform operations involving polynomial and “linear-over-linear” rational expressions
- (4) solve equations containing “linear-over-linear” rational expressions.
- (5) simplify and perform operations involving radicals and polynomials
- (6) solve systems of non-linear equations involving quadratic and linear equations
- (7) solve absolute value equations of the form $|ax + b| = c$
- (8) apply the rule of functions including accurately applying function notation of the form $f(a) = b$ for given values of a and b (not symbolic manipulation)
- (9) Create tables and interpret points from multilinear equations such as $z = 0.2x + 3y + 4$

Prerequisite Objectives – The following learning objectives are prerequisite to the course and will be tested exclusively through adaptive homework or their inclusion as part of another objective listed above. These prerequisite objectives include the ability to...

- (1) accurately use the order of operations in order to reduce an expression, including those with absolute values, signed numbers, fractions, and/or decimals.
- (2) add, subtract, multiply, and divide fractions and decimals
- (3) explain when and why to use common denominators when performing operations on fractions
- (4) identify whether a number is a whole number, an integer, or a real number
- (5) accurately and efficiently perform calculations with real numbers including fractions, decimals, signed numbers, absolute value, etc.