MAC1105 - College Algebra
Summer 2025 Online Syllabus

The information in this syllabus is preliminary and subject to change before the term begins.

Contact Information

The course home page is located in Canvas.
The Inbox in Canvas is the preferred method for communication for the class.

Instructor

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Email: carmichael@ufl.edu Phone: 352-294-2325
Office Hours: TBD

Introduction

Course Description

In this course, students will develop problem solving skills, critical thinking, computational proficiency, and contextual fluency through the study of equations, functions, and their graphs. Emphasis will be placed on quadratic, exponential, and logarithmic functions. Topics will include solving equations and inequalities, definition and properties of a function, domain and range, transformations of graphs, operations on functions, composite and inverse functions, basic polynomial and rational functions, exponential and logarithmic functions, and applications.

Prerequisite, Course Sequence, and Credit

This course covers 3 credit hours of General Education Mathematics (M) requirements. You must complete the ALEKS placement exam prior to registering for this course. This course assumes prior knowledge of intermediate algebra (Algebra 2) and the ability to do arithmetic without a calculator.

General Education Credit

- Mathematics

This course accomplishes the General Education objectives of the subject area listed above. A minimum grade of C is required for General Education credit. Courses intended to satisfy General Education requirements cannot be taken S-U.

Required Materials

The course text will be made available for free in Canvas. There is no textbook purchase required.

- College Algebra 2e, published by OpenStax

E-Learning and Canvas

Canvas is your main resource for this course. All class announcements, assignments, lecture outlines, lecture videos, and other information will be posted there. You can access Canvas by going to UF eLearning and logging in using your Gatorlink username and password. Your grades for assignments will also be posted on Canvas. You are responsible for verifying that your grades are accurate. I am always happy to discuss the content of an assignment, but grade issues must be dealt with in a timely manner.

Calculator Policy

A basic calculator will be provided on mastery quizzes. No other calculator or electronic device is allowed on mastery quizzes.
A calculator will sometimes be needed to complete homework questions. Desmos is a good online calculator.

Success

Success in MAC1105 comes from your effort and attitude. Spending time and energy to complete the class materials is critical. Research has shown that it is more effective to do a small amount of math every day rather than a large amount in a single day.
Most of the learning you will do in this course will come from the work you do on the course assignments. Mathematics is not a spectator sport. Watching someone solve a problem is very different from being able to solve it yourself. In order to succeed you must be willing to practice until you can answer questions independently.

Course Content and Goals

Course Content

This course is designed for students who intend to take a calculus course, either MAC2311 or MAC2233. It will prepare you for the Precalculus MAC1140 and MAC1147 courses, which will then lead to Calculus.
If you are taking this course for General Education Mathematics credit and you do not need Precalculus for your major or as preparation for Calculus, you should consider taking MGF1130. Please discuss your individual course needs with your college advisor.
The course goals are broken down into two categories:

- **Core Modules** These cover the necessary concepts and skills required for success in MAC 1140 or MAC 1147.
    1. Real Numbers and Functions
    2. Linear Functions
    3. Linear Inequalities
    4. Quadratic Functions
    5. Radical Functions
    6. Polynomial Functions
    7. Rational Functions
    8. Logarithmic and Exponential Functions
- **Advanced Modules** There are two tracks of advanced modules you can choose between. One track focuses on symbolic/algebraic concepts while the other focuses on visual concepts.

Core Modules

- Module 1 - Real Numbers and Functions
    1. Determine which subgroups of the real numbers a given value belongs to.
    2. Use the order of operations to evaluate a numeric expression using real numbers.
    3. Determine if a given graph or table represents a function.
    4. Evaluate a function given using function notation

    OpenStax College Algebra 1.1

    OpenStax College Algebra 3.1
- Module 2 – Linear Functions
    1. Construct a linear function given points
    2. Convert between linear forms of a linear function
    3. Convert between a linear equation and its graph
    4. Solve linear equations with integer or rational coefficients.

    OpenStax College Algebra 2.2

    OpenStax College Algebra 4.1
- Module 3 - Linear Inequalities
    1. Write and understand sets using set builder notation
    2. Transition from set notation to interval notation
    3. Solve single and compound linear inequalities
    4. Transition from an inequality to interval notation

    OpenStax College Algebra 2.7
- Module 4 - Quadratic Functions
    1. Factor the greatest common factor from an expression
    2. Factor trinomials
    3. Graph a quadratic function from its formula
    4. Solving quadratics by factoring
    5. Solving quadratic equations with the quadratic formula

    OpenStax College Algebra 1.5

    OpenStax College Algebra 5.1
- Module 5 - Radical Functions
    1. Find the domain of a radical function
    2. Sketch the graph of radical functions
    3. Solve linear radical equations
    4. Solve quadratic radical equations

    OpenStax College Algebra 2.6
- Module 6 - Polynomial Functions
    1. Identify the end behavior of a polynomial
    2. Identify the zeros of a polynomial
    3. Convert between a polynomial function and its graph
    4. Construct lowest-degree polynomial from its zeros

    OpenStax College Algebra 5.2

    OpenStax College Algebra 5.3
- Module 7 - Rational Functions
    1. Identify the domain of a rational function.
    2. Identify the intercepts of a rational function.
    3. Convert between basic rational functions and their graphs.
    4. Solve rational equations that lead to linear and quadratic equations.

    OpenStax College Algebra 5.6
- Module 8 - Logarithmic and Exponential Functions
    1. Describe the domain and range of an exponential function
    2. Describe the domain and range of a logarithmic function
    3. Convert between logarithmic and exponential forms of a function.
    4. Utilize the properties of logarithmic functions to simplify expressions.
    5. Solve exponential equations

    OpenStax College Algebra 6.1

    OpenStax College Algebra 6.2

    OpenStax College Algebra 6.3

    OpenStax College Algebra 6.6

Advanced Modules - Symbolic Track

- Module 9A –Combinations of Functions

  1. Evaluate an arithmetic combination of two functions
  2. Identify the domain of a combination of two functions
  3. Evaluate the composition of two functions.

  OpenStax College Algebra 3.4

- Module 10A – Inverse Functions

  1. Determine if a given function is one-to-one
  2. Evaluate the inverse of a function from a graph or table
  3. Find the inverse of a function from its formula

  OpenStax College Algebra 3.7

- Module 11A – Synthetic Division and Roots

  1. Divide two polynomials using Synthetic Division.
  2. Determine the possible rational roots of a polynomial.
  3. Use Synthetic Division to factor a polynomial completely.

  OpenStax College Algebra 5.4

  OpenStax College Algebra 5.5

- Module 12A – Complex Numbers

  1. Identify the real and imaginary parts of a complex number
  2. Perform arithmetic on complex numbers
  3. Plot a complex number in the complex plane
  4. Solve quadratic equations with complex solutions

  OpenStax College Algebra 2.4

Advanced Modules - Visual Track

- Module 9B –Circles and Triangles

  1. Classify a given triangle by acute/obtuse/right and eqilateral/isosceles/scalene
  2. Use the triangle inequality to determine possible lengths of a triangle's side
  3. Use the Pythagorean theorem to determine side lengths of a right triangle
  4. Use the distance formula to find the distance between two points
  5. Identify the center and radius of a circle from its standard form formula
  6. Construct the formula for a circle from its graph
  7. Find the area and circumference of a circle from its radius

  OpenStax Contemporary Mathematics 10.3

  OpenStax Intermediate Algebra 11.1

- Module 10B – Absolute Value

  1. Evaluate the absolute value of a number
  2. Use the definition of absolute value to rewrite an expression
  3. Sketch the graph of an absolute value function
  4. Solve an equation involving absolute value

  OpenStax College Algebra 3.6

- Module 11B – Linear Systems of Equations

  1. Determine if a given point is a solution to a system
  2. Determine the number of solutions a given linear system has
  3. Solve a linear system using a graph
  4. Solve a linear system algebraically

  OpenStax College Algebra 7.1

- Module 12B – Nonlinear Systems of Equations

  1. Characterize a given system as linear or nonlinear
  2. Solve a system using a graph
  3. Solve a nonlinear system algebraically

  OpenStax College Algebra 7.3

Student Learning Outcomes

At the end of this course students will be able to...

1. Determine which subgroups of the real numbers a given value belongs to.
2. Construct a linear function given points
3. Solve single and compound linear inequalities
4. Graph a quadratic function from its formula
5. Find the domain of a radical function
6. Construct lowest-degree polynomial from its zeros
7. Solve rational equations that lead to linear and quadratic equations
8. Convert between logarithmic and exponential forms of a function
9. Use a geometric or algebraic approach to classify a given equation or shape
10. Describe the algebraic meaning of a given intersection point or x-intercept

Students will also be expected to have achieved the General Education learning outcomes as follows:

- **Content** Students demonstrate competence in the terminology, concepts, theories, and methodologies used within the discipline. After completing this course students will be able to employ strategies in solving linear, exponential, and logarithmic equations, and inequalities, construct, define, and identify linear, quadratic, radical, rational, exponential, and logarithmic functions, analyze their properties, and perform basic algebraic operations on functions, apply synthetic division, evaluate basic limits, and construct and analyze the graphs of rational functions. (Content for Gen Ed Math, assessed through practice assignments, mastery quizzes, final exam).
- **Communication** Students communicate knowledge, ideas, and reasoning clearly and effectively in written and oral forms appropriate to the discipline. Throughout this course students will formulate mathematical models using algebraic, exponential, and logarithmic functions and will communicate mathematical solutions clearly and effectively. (Communication for Gen Ed Math, assessed through short-answer questions on practice assignments, mastery quizzes, final exam).
- **Critical Thinking** Students analyze information carefully and logically from multiple perspectives, using discipline-specific methods, and develop reasoned solutions to problems. In this course, students will reason in abstract mathematical systems, and they will apply mathematical models using algebraic, exponential, and logarithmic functions to solve problems. They will also develop and solve mathematical models of real-world word problems. (Critical Thinking for Gen Ed Math, assessed through practice assignments, mastery quizzes, final exam).

Course Structure and Graded Work

Modules

The content of this course is divided into modules. There are eight core modules you must master in order to pass the course. Once you have completed these, there are two tracks of advanced modules available that you can choose between. Completing advanced modules is required to earn a grade higher than C.

Structure

This course is a mastery-based class, which means that you must show your mastery of a module before moving on to the next. Your grade in the course is determined by how many modules you master by the end of the semester.

Pacing

Unlike a traditional course, the class is mostly self-paced. You can take the time you need to practice and solidify your understanding. While there is no minimum pace, there is a maximum pace of two modules per week. Two new modules will open each week, but you do not need to complete them that week! You may proceed through them at your own pace, but you must complete the eight core modules to earn a passing course grade.

Lecture

Each module's content is covered in prerecorded lectures and the textbook. You should view and read the content before attempting any assignments.

Assignment

After you have read and watched the content for a module, then you are ready for practice. Each module has an assignment of practice problems for you to complete in Canvas. These are the most important part of the course. Most of the learning you do will come from doing these practice problems. These assignments will assess your critical thinking and communication of the lecture content.

Mastery Quizzes

Once you have practiced it is time to show what you have learned! Each module has a mastery quiz that will unlock once when you finish the assignment. Mastery quizzes are proctored assessments that you must do on your own with no external help or resources. They are subject to the Student Honor Code.

- The mastery quiz for a topic will open a few days after the lecture and assignment.
- You don't have to be perfect to show mastery. A score of 80% is considered passing and sufficient to move on to the next topic.
- You may take a mastery quiz as many times as necessary, but after your third attempt you will need to contact your instructor to unlock more.
- Quizzes will be monitored and recorded using the HonorLock program. In order to use HonorLock you will need a web cam, the Google Chrome browser, and an isolated space where you can take your test.
- You must remain in one location the entire time you are taking a quiz. Moving to a different location during a quiz is a violation of the assignment rules.
- You may have **only** your picture ID, a pen or pencil, and blank scratch paper with you during a quiz.
- A basic calculator will be provided by the Honorlock system. All electronic devices, including phones, must be put away. Using or possessing any such device during a quiz is a violation of exam rules, regardless of whether or how it is used.

Final Exam

This course will have a comprehensive final exam covering the content of the eight core modules. Your performance on the final can raise or lower your overall grade by $\frac{1}{3}$ letter.

Extra Practice

In addition to the module assignments that you must complete, some modules will have extra practice assignments that utilize the Xronos software. These are not required, but will present you with different problem styles, perspectives, and complexity that can help increase your understanding.

Grading

Course Grade

This course is not graded like a traditional class.

- Your final grade in the course is primarily determined by the number of modules you master. There are 8 core modules you must master to earn a C.
- The final exam will be proctored like the mastery quizzes and assesses your critical thinking and communication of the lecture content.

Grading Scale

- **A** 8 core modules, 4 advanced modules in a track
- **B** 8 core modules, 2 advanced modules in a track
- **C** 8 core modules
- **D** 6 core modules

To earn a given letter grade, you must complete its minimum requirements. For instance, if you complete 8 core modules and 3 advanced modules you have not met the requirements for an A, so you final grade will be B-, B, or B+. Which of those you receive depends on your performance on the final exam (see below).

Final Exam

Your performance on the final exam can raise or lower your grade by $\frac{1}{3}$ letter grade.

- A score of 80% or higher on the final exam will raise your grade by $\frac{1}{3}$ letter, so a B would become a B+.
- A score below 60% on the final exam will lower your grade by $\frac{1}{3}$ letter, so a B would become a B-.

For information on how UF assigns grade points, visit the UF Grading Policy website.
A minimum grade of C is required for General Education credit. Courses intended to satisfy General Education requirements cannot be taken S-U.

University Policies and Resources

Attendance and Make-up Policy

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at the UF Attendance Policies website.

Incomplete/Concerns/Complaints

- **Incomplete** - A grade of I (incomplete) will be considered only if you meet the Math Department criteria. If you meet the criteria you must contact your coordinator before finals week to be considered for an I. An I only allows you to make up your incomplete work, not redo your work.
- **Concerns/Complaints** - If you have concerns/complaints about the course you may voice your concerns to the course coordinator, the Mathematics Department Associate Chair, and then the University Ombuds.

UF Evaluations Process

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online. Students can complete evaluations in three ways:

- The email they receive from GatorEvals
- Their Canvas course menu under GatorEvals
- The central GatorEvals portal

Guidance on how to give feedback in a professional and respectful manner is available at the Providing Feedback website. Students will be notified when the evaluation period opens. Summaries of course evaluation results are available to students on the GatorEvals Public Data website.

Additional Information

University Honor Code

UF students are bound by The Honor Pledge which states "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. See the UF Conduct Code for more information. If you have any questions or concerns, please consult with the instructors.

Courtesy In Communication

In all communication with your instructor, teaching assistants, and classmates you are expected to be respectful and follow proper netiquette.

Privacy and Data Security

This courses uses the MyOpenMath software for assignments. MyOpenMath does not sell or transmit personal data and deletes such information after an appropriate amount of time.

Students Requiring Accommodation

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Counseling and Wellness Center

Counseling and Wellness Center: 392-1575
University Police Department: 392-1111 or 9-1-1 for emergencies.

The Writing Studio

The writing studio is committed to helping University of Florida students meet their academic and professional goals by becoming better writers. Visit the writing studio online or in 2215 Turlington Hall for one-on-one consultations and workshops.

In-Class Recordings

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.
A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.
Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third-party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

Schedule

- May 12 Orientation open
- May 14 Modules 1,2 open
- May 19 Modules 3,4 open
- May 21 Module 1 due
- May 26 Modules 5,6 open
- May 28 Module 2 due
- June 2 Modules 7,8 open
- June 4 Module 3 due
- June 9 Modules 9,10 open
- June 11 Module 4 due
- June 16 Modules 11,12 open
- June 18 Module 5 due
- July 2 Module 6 due
- July 9 Module 7 due
- July 16 Module 8 due
- Aug 8 Final Exam due, all assignments close