MAC1105 Basic College Algebra Spring 2024

Sections: 13540, 13563, 13564

Instructor Information

Course Instructor: TBD

Contact: TBD
<mark>Before sending a message, be sure to check the most recent announcement!</mark>

Office Hours: TBD
These times are meant for students to get quick answers to their questions. *You do not need have video or even audio to join these meetings.* Come in and ask your questions via chat, audio, or video.

Additional information about the course can be found on Canvas.

Description of Course

MAC 1105 (Basic College Algebra) is a review of Algebra designed to prepare students for MAC 1140 or MAC 1147. Content for this course includes: reviewing real and complex numbers, solving various types of equations, graphing basic functions, and exploring exponential and logarithmic functions. ***This course fulfills 3 credit hours of General Education Mathematics requirements (https://undergrad.aa.ufl.edu/general-education/gen-ed-program/subject-area-objectives/).***

NOTICE – This course is designed for students who will eventually take Calculus or need MAC 1105 for their major. Students looking only to complete their general math requirement should heavily consider taking *Math for Liberal Arts Majors 1* (MGF 1106) or *Math for Liberal Arts Majors 2* (MGF 1107).

Course Goals and Objectives

This course is designed to prepare students for MAC 1140 or MAC 1147. Content includes: reviewing real and complex numbers, solving various types of equations, graphing basic functions, and exploring exponential and logarithmic functions. The course goals are broken down into two categories:

I) *Core Modules:* The necessary concepts and skills required for success in MAC 1140 or MAC 1147. These Modules cover:
   1. Real and Complex Numbers
   2. Linear Functions

3. Linear Inequalities
4. Quadratic Functions
5. Radical Functions
6. Polynomial Functions
7. Rational Functions
8. Logarithmic and Exponential Functions

This represents the necessary concepts and skills of College Algebra. After a review of the types of numbers we will encounter in the course, each Module explores a particular class of functions. Objectives for each Module are listed on the next page.

II) *Advanced Modules:* Preparation for how concepts in this course can be used in various academic paths. These Modules will prepare you for Calculus or Biological Sciences.

A) This set is designed to prepare you for the first concept you will encounter in Calculus: Limits.

B) This set is designed to prepare you for modeling real-life phenomena using functions we explored in the Core Modules.

These sets build on the types of functions we explored in the Core Modules. They capture the two most common reasons students take MAC 1105. Students will only work on one of the two tracks.

Objectives and a brief summary for each Module are listed on the next page.

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Core Modules

Module 1 - Real and Complex Numbers
- *Identify the subgroup of Real numbers a number belongs to.*
- *Identify the subgroup of Complex numbers a number belongs to.*
- *Apply the properties of Real numbers to simplify large expressions.*
- *Generalize the properties of the Real numbers to Add/Subtract/Multiply/Divide Complex numbers.*

Module 2 - Linear Functions
- *Construct linear functions using various information about the function.*
- *Translate between different forms (Point-Slope, Slope-Intercept, Standard) of a linear function.*
- *Translate between representations (equation, graph, description) of a linear function.*
- *Solve linear equations.*

Module 3 - Linear Inequalities
- *Translate between a written description and interval notation for linear inequalities.*
- *Convert between linear inequalities, graphs of linear inequalities, and their interval notation.*
- *Solve linear inequalities.*

Module 4 - Quadratic Functions
- *Construct quadratic functions using various information about the function.*
- *Translate between representations (equation, graph, description) of a quadratic function.*
- *Translate between different forms (Vertex, Standard, and Factored) of a quadratic function.*
- *Solve quadratic equations.*

Module 5 - Radical Functions
- *Identify the domain of a radical function.*
- *Translate between representations (equation, graph, description) of a radical function.*
- *Solve radical equations.*

Module 6 - Polynomial Functions
- *Identify the end behavior of a polynomial function (in factored form).*
- *Identify the zero behaviors of a polynomial function (in factored form).*
- *Translate between representations (equation, graph, description) of a polynomial function.*
- *Construct lowest-degree polynomial functions given their zeros.*

Module 7 - Rational Functions
- *Identify the domain of a rational function.*
- *Translate between representations (equation, graph, description) of a rational function.*
- *Solve rational equations.*

Module 8 - Logarithmic and Exponential Functions
- *Identify the domain/range of logarithmic or exponential functions.*
- *Translate between different forms (logarithmic and exponential) of an equation.*
- *Utilize the properties of logarithmic functions to solve logarithmic equations.*
- *Solve exponential equations with same or different bases.*

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Advanced Modules

Calculus	Biological Sciences
This set is designed to prepare you for the first concept you will encounter in Calculus: Limits.	This set is designed to prepare you for modeling real-life phenomena using functions we explored in the Core Modules.
A9 – Operations on Functions • *Identify the domain after operating ($+-$, x, $\div$) on functions.* • *Evaluate the composition of two functions.* • *Recognize whether a function is 1-1 or not.* • *Solve for the inverse of a function, if it exists.*	**B9 – Modeling with Linear Equations** • *Identify when a real-world situation would require a linear function.* • *Describe the domain on which the model is valid.* • *Construct a linear model equation for the real-life situation.*
A10 – Synthetic Division • *Apply synthetic division to divide two polynomials.* • *Describe the possible rational or integer roots of a polynomial.* • *Apply synthetic division to completely factor a polynomial.*	**B10 – Modeling with Power Equations** • *Identify when a real-world situation would require a direct variation equation.* • *Identify when a real-world situation would require an inverse variation equation.* • *Construct a power model equation for the real-life situation.*
A11 – Introduction to Limits • *Describe what the limit of a function represents.* • *Evaluate the left or right limit of a function.* • *Evaluate the limit of a function.*	**B11 – Modeling with Log or Exponential Equations** • *Identify when a real-world situation would require a logarithmic function.* • *Identify when a real-world situation would require an exponential function.* • *Construct a log/exp model equation for the real-life situation.*
A12 – Graphing Rational Functions • *Use limits to determine the holes of a rational function.* • *Use limits to determine the vertical asymptotes of a rational function.* • *Use limits to describe the horizontal asymptotes of a rational function.* • *Use limits to describe the oblique asymptotes of a rational function.*	**B12 – Solving Real-World Modeling Word Problems** • *Determine the appropriate type of function to model the situation.* • *Construct a model equation for the real-life situation.* • *Solve the real-world modeling problem.*

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Weekly Course Schedule

Week	Topics	Assignments
1	Module 1	
2	Modules 1 & 2	Practice Quiz (1/12)
3	Modules 2 & 3	Progress Quiz 1 (1/19)
4	Modules 3 & 4	Progress Quiz 2 (1/26)
5	Module 5	Progress Quiz 3 (2/2)
6	Module 5	Make-up Quiz (2/9)
7	Module 6	Progress Quiz 4 (2/16)
8	Module 7	Progress Quiz 5 (2/23)
9	Module 8	Progress Quiz 6 (3/1)
10	Modules 9A, 9B, 10A	Progress Quiz 7 (3/8)
	Happy	Spring Break!
11	Module 10B & 11A	Progress Quiz 8 (3/22)
12	Module 11B	Make-up Quiz (3/29)
13	Module 12A	Progress Quiz 9 (4/5)
14	Module 12A	Progress Quiz 10 (4/12)
15	Module 12 B & Review	Make-up Quiz (4/19)
		Final Exam (4/27)

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Student Learning Outcomes (SLOs)

After successful completion of this course students will have demonstrated competency in the following General Education Student Learning Outcomes (SLOs):

- **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. (Critical Thinking for Gen Ed Math, assessed through weekly assignments, homework, progress 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 weekly assignments, homework, progress 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 weekly assignments, homework, progress quizzes, final exam).

Course Materials

Canvas is your main resource for this course. You can access Canvas by going to https://elearning.ufl.edu/ and then using your Gatorlink username and password to login.

Textbook	Lectures	Xronos	Descriptive Keys
This course uses an open-source textbook, which can be found at https://openstax.org/details/college-algebra. Purchasing a copy of the textbook	You will have access to video lectures for all of the content of the course. These videos can be found on Canvas and through the	Xronos is an innovative online homework platform developed by the Ohio State University. Using this platform is	Computer-generated keys are released after each exam that *describe the types of mistakes associated to each option.* You can find previous

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is <u>not</u> required.   individual homework.   *completely free* to students.   semester's exams here.

Materials You Need for the Course

Here is a list of what you absolutely need for the course. <mark>If you do not have one or more of these things, please contact the coordinator.</mark>

- Computer with strong internet access
- Chrome browser
- Admin privileges to install/uninstall Chrome extensions

- Computer camera
- Test-taking room
- Scientific, non-graphing calculator

Course Structure

This is a [Mastery-Based course](#) that will allow you to progress at your own pace as you show mastery of the content. One of the benefits to this model is that you will not be forced to keep pushing forward in the course when you do not know the fundamental material! All of the lectures will be provided via video online.

The content of this course is divided into **12 modules: 8 core modules and 4 advanced modules.** Approximately once every week, you will have the opportunity to show mastery in up to 2 modules (**referred to as "Progress Quizzes"**). If you show mastery, great! If not, you will be able to retry the module again during the next quiz. In this model, tests are no longer high-stakes assignments where a bad day could sink your grade.

Proctored Assessments

Progress Quizzes

These quizzes check your progress on learning material in the course. You will take the 2 Modules you are on during each of these times. **You will have a 2-day window to take each Progress Quiz through Honorlock.** You do not need to make an appointment to take the quiz. Schedule of quizzes can be found on Canvas.

Final Exam

This is a cumulative, 2-hour, 25 multiple-choice question exam over Modules 1-8 (Core Modules). **All students with a grade higher than an E are expected to take the final exam on Saturday, April 27, 2024, (as scheduled by the registrar's office) through Honorlock.**

Non-Proctored Assessments

Weekly Assignments   Core Modules Homework   Advanced Modules Homework

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Weekly assignments are meant to keep you engaged in the course and provide the small group interactions you would get if the course met in person. **Weekly Assignments are due by 11:59pm EST Sundays.** Exact dates are provided in Canvas for each assignment.

This is your online homework system for the majority of the course. **Everyone is expected to complete at least 80% of the Core Homework by the last day of class, April 24th, 2024, 11:59pm EST.**

This is the online homework associated to one of two advanced content paths you could take in the course. You are only expected to work in one path! **Students who master at least one Advanced module are expected to complete some portion of the Advanced Homework by the last day of class, April 24th, 2024, 11:59pm EST.**

Grade Breakdown

Rather than calculating points and percentages, your grade in this course is primarily based on meeting certain thresholds. This is known as Specifications Grading and is commonly used with mastery grading models.

Your base letter grade is determined by the number of Modules you master during Progress Quizzes. Other assignments modify your base letter grade: missing an assignment threshold lowers your letter grade by 1/3 letter while exceptional performance on the Final Exam (80%+) raises your letter grade by 1/3 letter.

Base Letter Grade Thresholds: *Mastery through Progress Quizzes*

   A: 8 Core Modules, 4 Advanced Modules
   B: 8 Core Modules, 2 Advanced Modules
   C: 8 Core Modules
   D: 6 Core Modules

Other Assignment Thresholds: *Missing a threshold lowers your letter grade by 1/3 letter*

- **Core Modules Homework:** 80%
- **Advanced Modules Homework:** 20% x *(# of Adv. Modules mastered)*
- **Weekly Assignments:** 80%
- **Final Exam:** 60%

University policy stipulates that a minimum grade of a C must be achieved to obtain Gordon Rule or General Education credit. UF grading policies are at https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx.

Attendance, Late, and/or Missed Work Policies

- All homework assignments on Xronos will be due **April 24th, 2024, 11:59pm EST.** There will be no make-up or extensions for these assignments as they are available all semester long.

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- Progress Quiz make-ups are available once a month. Students do not need a university-approved reason to take a make-up. Scheduled make-up periods are meant to reduce the stress of potentially missing a quiz and are not a way to take more than 10 Progress Quizzes.
- You will have a 2-day window to take each Progress Quiz through Honorlock. These periods will not be extended for any reason. Instead, there will be 2 make-up quiz periods where students can take missed Progress Quizzes.
- 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: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx
- Athletes who anticipate missing numerous Progress Quizzes should contact the coordinator to set up an alternative schedule for their quizzes. **Makeups will not be provided after the last day of class.**

University Policies and Assistance

Students with Disabilities should do the following:

1. Register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation.
2. Email your accommodation letter to the course instructor, along with any additional information.
3. Additional time will be provided on Honorlock. **There is no need to take your exams through the DRC**.

This should be done as early as possible in the semester. However, you can submit your accommodation letter to the coordinator at any point in the semester.

Academic Honesty: 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 Honor Code (https://catalog.ufl.edu/ugrad/1617/advising/info/student-honor-code.aspx) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the course coordinator or TAs in this class.

Online Course Evaluation: Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluations are available to students at https://gatorevals.aa.ufl.edu/public-results/.

Campus Resources: The following resources are available to all students.

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<u>U Matter, We Care:</u> If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.
<u>Counseling and Wellness Center:</u> https://counseling.ufl.edu/ , 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.
<u>Sexual Assault Recovery Services (SARS)</u> Student Health Care Center, 392-1161. <u>University Police Department</u>, 392-1111 (or 9-1-1 for emergencies). http://www.police.ufl.edu/
<u>UF Student Success:</u> *For improving study skills to connecting with a peer tutor, peer mentor, success coach, academic advisor, and wellness resources, go to http://studentsuccess.ufl.edu.*
<u>Teaching Center Math Lab</u>: LIT 215. Offers free, informal tutoring.
https://academicresources.clas.ufl.edu/