MAC1140 - Precalculus Algebra

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Office Hours: See "Contact" page on Canvas. Current office hours are: Monday 1pm-2pm, Wednesday 3-4pm, Friday 1pm-2pm, and by Appointment

Please see Canvas Contact Page for most up-to-date details on TA's office hour times and contact information. Note that, since this is an online course, office hours are held via Zoom, not in person in the office. You can find the Zoom office hour link on the Canvas Homepage under "Contact".

Syllabus

Course Description

This is MAC1140 - "Precalculus Algebra". This course will cover all standard aspects of precalculus except for trigonometry. This includes; terminology, variables, general functions, basic modeling of real world examples, translations, transformations, polynomials, radical functions, exponential functions, logarithmic functions, piecewise functions, and rational functions.

A minimum grade of C (not C-) in MAC1140 satisfies three credits of the university General Education Math requirement. See more about this in the General Education Information below.

Prerequisites

MAC1140 does not require any prerequisites, but it does assume basic numerical literacy. Students should be able to do basic arithmetic without a calculator. If the pace or level of course material appears to be beyond your experience or ability I highly suggest you look into taking MAC1105 "College Algebra" instead. You may switch courses at https://student.ufl.edu/ during the drop-add period. If you want advising on which courses to take or a path through the required math courses for your major, you should talk to your academic advisor, and/or the undergraduate mathematics coordinator. You can find contact information for the undergraduate math coordinator at https://math.ufl.edu/people/administration-2/.

Course Materials

There are no required materials for this course; specifically there is no required textbook, clicker, or online homework code that you must purchase for this course.

In this course we will utilize a free online homework system known as Xronos. This work is supported by the Office of the Provost and the College of Liberal Arts and Sciences. The platform is accessible through the Canvas site via the "assignments" tab. More details are available on Canvas.

Note that any Recommended/Required reading assignments will be listed in Canvas, likely in the listed module/lessons for the week. In addition, announcements and/or emails will be sent out to supplement as needed.

Course Goals:

This is MAC1140 "Precalculus Algebra". The goal of this course is to provide the mechanical and conceptual tools necessary to continue on to Business Calculus' (MAC2233). If, in addition, a student takes MAC1114 "Trigonometry", they have the tools necessary to go on to 'Calculus One' (MAC2311). Alternatively one can take the accelerate combined Precalculus algebra and trigonometry class MAC1147 instead of taking MAC1140 and MAC1114.

Online Resources

E-learning Canvas, a UF course management system, is located at https://elearning.ufl.edu. Use your Gatorlink username and password to login. All course information including your grade on assignments, course homepage, syllabus, Xronos content (which includes lecture videos and practice problems), office hours, exam information, mail tool, discussion forum, free help information, etc. can be accessed from this site. **You are responsible for verifying that your grades are accurate. There is no grade dispute at the end of the semester** (see below for specifics on the grade dispute policy). Note that the Canvas "course grade" is rarely accurate given Canvas's limited ability to calculate grades. So, although you should verify your assignment grades are accurate, you should use the grade calculator (the link is also located in the orientation module) to determine your actual course grade. Make sure to carefully follow the directions to setup the calculator correctly (you should **not** need to request permission to access it). Canvas's difficulty in correctly calculating final grades is also why the "show final grade" option is disabled in Canvas - that grade would likely be very misleading - so use the custom grade calculator.

Instructional Design

The vast majority of instructional content for this course will take place via the Xronos system. This is an interactive site that will contain both the (embedded) lecture videos and text content which will provide the instructional content, as well as practice problems and example exams.

Keep in mind that, as much as I try to make the lecture videos as ideal and engaging as possible, this is only one step in the process. You should think of the lecture videos as a starting point. You should also read the associated text (which may also contain other examples, or specific information). When you have questions, take the time to email the instructor/TA(s), or attend any of their office hours.

If you never interact with the instructor or TA outside of the required meetings, it is unlikely that you will be able to learn all the material you need - to the depth you need to know it - to do well on the assessments for that material. More importantly you are passing up an invaluable resource in the form of personalized one on one instruction from an expert in the field to help you with whatever questions you have, big or small. We want to help, but we can't if you don't ask us questions; we aren't mind readers and can't know what you need help with without some help from you first!

When it comes to the lecture videos there are a few things to keep in mind as you watch them. Please read below to understand why some parts of the videos might be boring, while some might seem way too hard.

- First and foremost this course is intended to get students prepared for one of the UF calculus sequences. The calculus sequence is *considerably* more conceptual, rigorous, and difficult than high school or advanced placement (AP) type courses, and the precalculus courses are similarly much more difficult in preparation for this. In particular, even students that routinely have gotten A's in their math courses in high school will likely find this course quite challenging.

- This course also aims to get everyone on the same mathematical level in terms of notation, communication, and terminology before students move forward. As such there will inevitably be times when you will find the content boring or otherwise elementary (for stuff you are quite familiar with but others may not be) and other times it will seem like content is going by way too fast or without enough detail (for content that you may be less familiar with). This is because not everyone will be familiar with any given aspect, which means we must cover everything to some extent. However, due to the quantity of material that we need to cover from this, each of these excursions will be only a brief overview.

- In this course we also aim to instill the basics of mathematical reasoning. This means teaching how to problem solve when presented with content that is otherwise unfamiliar. Importantly this means that **you should expect to be confronted with problems that you have not seen before**. If you have always had problems that are variations of problems that have been demonstrated for you already, then your teachers have done you a grave disservice.

- **Expect to have to reason and think on the fly during exams, quizzes, and homework.** You will almost certainly see questions on your assessments that are unfamiliar. Remember that part of the content for this course is teaching you **how to recognize aspects of a problem, which inform what techniques you should use**.

- Finally, remember that math, by its nature, is cumulative. If an exam has listed content that will be tested, that means that the listed content is the *focus* of the exam, but *not the only skills necessary for the exam.* Clearly we will not list on every exam things like 'addition' or 'multiplication' as exam topics. Similarly, most of the content that we will cover in this class, by it's nature, will be used in future content of this same course. Thus you should consider all exams as "cumulative" with the listed content for the exam being the primary *focus* of the exam.

Grade Dispute Policy

Please be aware that there is a policy that any grade disputes **must** be brought up *before* the date of the final exam. Also keep in mind, it is not uncommon for lots of students to ask about grades right before the final (as well as actual math questions regarding the final exam, Xronos, quiz drops, etc) meaning that the email volume is rather high around that time period. I mention this so you are aware that you should try your best to bring any grade issues to my attention (by emailing me directly or messaging me on Canvas) as soon as you can, rather than waiting until the last moment, when a lot of other people are emailing me and I am getting swarmed by emails -

causing much higher reply lag. A good rule of thumb is to try and make sure that you contact me within a week of getting your grade back, if you have any questions or concerns about the grade - to make sure we have plenty of time to resolve any issues before the final exam date.

Calculators

A graphing calculator and Wolframalpha are useful as study and learning tools when used appropriately, **but they are not essential.** I also recommend the online graphing calculator Desmos (https://www.desmos.com), and the app GeoGebra (https://www.geogebra.org) to help you as you learn the material. Keep in mind however, mathematics is a collection of ideas that are not mastered through calculator skills. **No calculators are allowed on quizzes or exams.** Also note that exams are written with the lack of calculator in mind.

Incomplete Policy

A grade of I (incomplete) will be considered only if you meet the Math Department criteria which is found at https://www.math.ufl.edu. If you meet the criteria you must see the instructor before the beginning of finals week to be considered for an I. A grade of I only allows you to make up your incomplete work. You cannot redo any previously completed work.

Online Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course 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 evaluation results are available to students at `https://gatorevals.aa.ufl.edu/public-results/`.

Advising and Help

- The Orientation has an "FAQ" with links and answers to the **vast majority** of questions students encounter in a given semester; from problems with Xronos, to who to contact with a question, comment, or concern. I would highly recommend using the FAQ as a first point of reference when you have a question!
- For issues with technical difficulties for Canvas, please contact the UF Help Desk at:
  - Website: https://helpdesk.ufl.edu
  - Phone: (352) 392-HELP (4357)
  - Walk-in: HUB 132

  Note: Any requests for make-ups due to technical issues MUST be accompanied by the ticket number received from the Help Desk when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request a make-up.
- For any concerns with MAC1140, please talk to your TA or Instructor! Office hours will be posted and are regular times when they are available to answer questions, discuss grades, advise students on future classes, or help students in any available way. You do **not** need an appointment to visit during office hours. If you need to meet **outside** of office hours, please contact your TA or Instructor for an appointment.
- In addition, there are several other free resources available to you:
  - The Teaching Center Math Lab, located at SE Broward Hall, offers free informal tutoring. You may want to attend different hours to find the tutors with whom you feel most comfortable. Also the Little 215 Tutoring Center provides free tutoring for courses up to Calculus 1. Go to https://www.teachingcenter.ufl.edu to find their hours. You can also request free one-on-one tutoring.
  - A list of qualified tutors for hire is available at https://www.math.ufl.eduhttps://www.math.ufl.edu.

  - Other resources are available at https://www.distance.ufl.edu/getting-help for:
    * Counseling and Wellness resources
    * Disability resources
    * Resources for handling student concerns and complaints
    * Library Help Desk support

- Should you have any complaints with your experience in this course please visit https://www.distance.ufl.edu/student-complaints to submit a complaint.

Class Demeanor or Netiquette

All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats. A guide to online etiquette is available at:
http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf

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 website for more information. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Students with Disabilities

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting: https://disability.ufl.edu/students/get-started/. 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. If a student does not supply the appropriate documentation in a timely fashion, the instructor may not be able to accommodate the student in a timely manner.

Online Privacy

ONLINE PRIVACY: Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute bu?on activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

General Education Information

General Education Objective (Mathematics)

You may find the most up-to-date area objectives online here.

> Mathematics courses must afford students a mastery of foundational mathematical and computation models and methods by applying such models and methods in problem solving. Courses in mathematics provide instruction in computational strategies in fundamental mathematics including at least one of the following: solving equations and inequalities, logic, statistics, algebra, trigonometry, inductive

and deductive reasoning. These courses include reasoning in abstract mathematical systems, formulating mathematical models and arguments, using mathematical models to solve problems and applying mathematical concepts effectively to real-world situations.

This course provides the fundamentals in solving equations, inequalities, and manipulating various functional types using primarily deductive logic techniques. It also covers the basics of mathematical modeling and how to apply mathematical concepts to real-world situations.

Student Learning Outcomes (SLOs)

In general, the following Student Learning Outcomes are intended to be covered in the course:

Content: Students demonstrate competence in the terminology, concepts, methodologies and theories used within the discipline.

Communication: Students communicate knowledge, ideas, and reasoning clearly and effectively in written or oral forms appropriate to the discipline.

Critical Thinking: Students analyze information carefully and logically from multiple perspectives, using discipline specific methods and develop reasoned solutions to the problems.

For more on the general subject area objectives for mathematics (and other disciplines) you can visit UF's master list here.

Note: Each of these SLOS are assessed via Xronos practice content, regular Canvas quizzes, and Canvas Exams (see grading section for details on the assignments). Each assignment has an information section in Canvas that, among other things, list the specific SLOs and content that is covered on that specific assignment. Again, to be clear, **each of the following SLOs** are addressed by at least one Xronos tile (usually several), (at least) one quiz, and (at least) one exam, as well as the final exam.

How these SLOs are addressed in MAC1140 are outlined below. Specifically, by the end of the course, students should be able to...

- Correctly use critical terminology, concepts, methods, and theories from concept videos and text to express mathematical ideas accurately and succinctly. This will include terminology used within the discipline to communicate mathematical ideas efficiently and accurately.
- Solve algebraic systems modeled by a variety of function types.
- Recall and apply several important theorems appropriate to the course level.
- Demonstrate their competencies via interactive online coursework, quizzes, and exams.
- Interpret and explain various levels of data, from premodeled systems, to real-world descriptions that require mathematical modeling.
- Solve for desired information from their models, in order to answer questions about the situation being modeled.
- Develop and manipulate their own models from descriptions of real world events or problem statements, which may include extraneous information or even incomplete information (forcing students to propose what information would be necessary to complete the model and/or solve for the desired information).
- Apply critical thinking, as described in the Instructional Design and Exam Design sections to complete any/all of the above SLOs.

Each of these SLOs are assessed via the Xronos practice content, Canvas Quizzes, and the Canvas Exams.

Grading

See the tables below to see what will contribute to your grade, and what is necessary to attain a specific grade.

Assignment	Point Value	Total Points
Xronos (3 assignments)	34, 33, and 33	100
Quizzes (10 of 14)	10	100
Exams (3 total)	50	150
Final	100	100
Total Points		450

Grade	Point Range	Grade	Point Range
A	405-450	C*	315-329
A−	390-404	C−	300-314
B+	375-389	D+	285-299
B	360-374	D	270-284
B−	345-359	D−	255-269
C+	330-344	E	0-254

∗ Note that a minimum grade of C is required for General Education credit.

Online Coursework

In this course we will utilize an in-house interactive online homework system developed by the math department at UF. This platform, called Xronos, is free of charge.

The lecture videos are embedded, along with supplementary videos and interactive content spread throughout for asyncronous learning in the course. There are three Xronos assignments in Canvas, one for each of the content modules. Each of these is an interactive set of course notes and videos that presents the course information and practice. It has numerous interactive features as well as examples and problems scattered throughout. Each assignment should be completed by the end of the relevant module, although you can return to do more practice and even earn more credit for any of the Xronos assignments until the final exam.

I recommend you **do not try to complete the entire assignment at the end**. First, there is simply too much to do all at once, and second it is intended as one of the primary sources of learning for the exams and content. Your best bet is to be diligent and do the Xronos content throughout the semester as outlined in the module.

There are some notes to keep in mind about how Xronos works:

- You **MUST** access Xronos via Canvas **every single time you do your homework.** Do not bookmark the page, do not save the page, do not access Xronos directly via a link – you **MUST** go through Canvas **EVERY TIME**. If you do not – you will not receive credit for the problems you solve. This cannot be stressed enough.
- Canvas may (and almost certainly will, often) tell you that a grade has been submitted for the "Xronos assignment" whenever you work on it. Rest assured that canvas really means that a grade **update** has been submitted, not a final grade. You can continue working on Xronos and accumulating points, right up until the Xronos assignment is due; there is no "final submission" of a grade prior to that, regardless of what canvas might try to tell you.
- Throughout the text there are problems embedded to monitor learning and give examples. These are counted as part of the grade, and you are required to complete these to get credit for the assignment. You are free to work together on these problems, but keep in mind they are intended as practice, and as such **you are responsible for knowing the material covered in the homework**.
- In most of the concept tiles (the square tiles, as oppose to the thin vertical rectangles) are lecture videos. Completing watching these counts toward credit for completion for the tile, so you must watch the videos in order to get full credit for the tile (and thus the Xronos assignment).

Quizzes

Quizzes will be administered in Canvas. These will be twenty-five minute assessments to keep you up to date on the content as we progress through the course. There are fourteen quizzes offered, but we will count the top ten grades (meaning the four lowest grade quizzes will be dropped automatically when grades are calculated). Keep in mind, with the way the course is structured, assessments will get progressively harder as we go through the semester. This means if you skip a quiz early on and decide it will be a "drop" quiz, that you will be trading a much easier quiz for a much harder one later on.

Quizzes have a listed due date in Canvas to reflect when they should be taken as you go through each module at the recommended pace. That being said, since this is an asynchronous course, I understand that some students

may have schedules that make regular quiz due dates difficult. For this reason, every quiz has an automatic makeup period that allows you to take the quiz on any day up until **the day before the module exam**. Please keep in mind, since the quizzes have this automatic makeup period, there are **no further extensions** for quizzes.* In particular, if you wait until the day before the exam, and then you can't do the quizzes for some reason (internet stops working, computer crashes, whatever) then you will end up getting a zero for all the quizzes... so make sure you try and get all the quizzes done at least a few days before the module exam, so you have a buffer in case something goes wrong.

Exams

Exams in this course will be proctored using a proctoring service called Honorlock. Information on how to sign up for Honorlock will be posted to canvas. The exams will be open all day on the assigned day, so you should be able to schedule your time around any other responsibilities that day, but if you have concerns please contact your instructor. Also ensure that you are in an area with a stable internet connection, and that you have ensured Honorlock works (I would recommend taking the Honorlock test quiz, which is not worth any points but should verify the technology works on your setup).

There are three exams during the semester, with a final at the end (for a total of four tests). The specific date for each exam can be found in Canvas; but the content is as follows:

Exam	Content
Exam 1	Module 2
Exam 2	Module 3
Exam 3	Module 4
Final	Cumulative

Note that, since this is an entirely online course, there are no previous exam pdfs to provide - however, there are practice exams available through Xronos that provide unlimited practice content via the "Try Another" button in the top right corner. You can find links to the practice exams in Canvas, as well as here.

An Important Note About Exam Design

The exams are *not* written with the intention that the problems are ones that you have already seen with different numbers. One of the primary purposes of this course is to teach you how to use mathematical tools to solve mathematical problems, which requires knowledge, understanding, and creativity to figure out which tool to use, when to use it, and how to use it correctly. We aren't trying to teach you to (only) follow a preset list of instructions. We are trying to teach you to be a problem solver; one who can utilize their knowledge and skills to unravel a completely new problem when they are confronted with one.

Unfortunately, this exam design philosophy is probably unlike most (perhaps all) of your previous math course experiences. This is important to note because this means that the study methods you have used up to this point to excel in your classes, are likely not going to be nearly as effective in getting you the grades you are use to at UF. To be clear, this isn't an issue of scale - it isn't about "just studying more", it is about *studying differently*. In particular, you should try and actively evaluate your study methods and goals, and determine what changes you may need to make to better align your study goals to the assessment goals of your class. As a place to start, I have written a primer on studying techniques that are supported by scientific evidence. There is a "TLDR" section that just has a list of techniques and how useful they likely are, but there is also a section with detailed explanation of the science that you can use to better tailor your study methods to try and develop study techniques that work well for you personally - to get the kind of outcomes that you are after.

Final

There will be a final exam (see Canvas for the date) which will be cumulative, thus any content covered this semester is "fair game" for the final (including any content covered after the last exam prior to the Final). Since the final is cumulative, I will replace your lowest exam score with half the points you earn on the final (only if it helps. Notice that the final is worth twice the points of a standard exam, thus half the points on the Final will be equivalent to the number of points on a single exam. In other words - the percent you get on your final exam will replace the

*There is one exception - if you have an excused absence period that starts on/before the quiz due date, and extends until the module exam - thus enveloping all of the default makeup period, you should contact me and let me know so we can determine a time for you to make up the quizzes that will be missed as a result of that excused absence

percent on your lowest exam score if it helps). This will be done automatically, **You do not need to request this**. Moreover, this grade substitution is done *only* in the calculation process, the actual exam grades themselves won't change in Canvas (for academic record reasons).

Course Attendance and Interaction

This course is provided online and asynchronously. This means that there are **no** regular meeting times of the entire class, or even smaller subsections (e.g. sections for discussion courses) as part of the base structure. This clearly means that attendance is not tracked or mandatory - since there is no regular meeting to attend. Moreover, due to the course design, the makeup policy is intended to be more forgiving for those with complex schedules (see below). Nonetheless, keep in mind that the attendance policy adheres to UF's attendence and makeup policy.

This is intended to allow a more flexible scheduling of content, especially for those that have irregular schedules - like full time work or considerable travel or other responsibilities outside of coursework. The intent is that the content is broken up in such a way that you can do larger chunks in advance - to account for times when you might not be able to do regular course work throughout a week as is typical in a more standard course.

Unfortunately, this also means that it is very easy to lose track of content and fall behind and due to a lack of forced meeting times, it can also feel isolating. I encourage you to regularly post in the discussion board, email, and/or attend office hours to help keep a regular schedule - whatever that means in relation to your own non-academic schedule.

Makeup Policies

Requirements for class attendance - and the makeup policy - in this course is consistent with university policies, which can be found here. See below for class policies by type of content.

- **Attendance:** This is an online only asynchronous course, so attendance is not taken or required - however it should be noted that those that regularly attend office hours tend to perform dramatically better than their peers on average.
- **Xronos:** There are no make-ups for Xronos since it is due at the end of the semester (i.e. since it is due after the final exam, there would be no time to provide as extension/makeup).
- **Quizzes:** Each quiz has a due date assigned in Canvas that follows the recommended timeline of completion of the course. I realize many students take online asynchronous courses due to busy schedules outside of courses; and with this in mind quizzes are granted an automatic makeup period to take them that lasts until **the day before** the exam on that material. This grace period imposes no penalty. Keep in mind that if you wait until the day before the exam to do the quizzes for any reason (including as a study aid) and then something goes wrong (getting sick, technology malfunction, etc) there are no additional extensions or makeups offered[†] - since the grace period already extends a penalty-free makeup period of days or even weeks.
- **Exams:** In order to get a makeup exam you must have a documented (and valid) reason to miss the exam. Otherwise you must rely on the Exam replacement by Final Exam option mentioned above.

You can find the UF guidelines on grading here: https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/.

Student Grade Calculator

Due to the fact that Canvas is incapable of computing grades in a way that is compatible with the outlined grade policy above, I have written a grade calculator that you can use to compute your current standing in the course whenever you want. Note that it requires configuration for the given semester/course that you are using it for, so you must read in the included instructions carefully and completely before using it. This tool is provided for students to copy and use on their own, to avoid any issues with student records and/or FERPA issues - meaning that you will be required to copy the tool to your own account rather than use it on the page provided (which is hosted in a public domain). Here is the link to the student grade calculator.

[†]With one exception, see the footnote on the Quizzes section for details

Calendar

In general, each week will involve a listed segment of Xronos to complete, which will involve somewhere between 3 and 8 concept videos (generally more at the beginning of the semester due to review) and associated text - typically between 3 and 10 pages of reading (again, more text at the beginning of the semester due to review, and less as we progress through the semester). Each week will have a quiz on that week's material, and each of the listed modules below will culminate in an exam. Regular practice problems are given throughout the process, with a minimal number being required, but unlimited practice supplied via algorithmic problem generation. More on this is described in Canvas, along with a very specific assignment breakdown - which can fluctuate slightly from semester to semester due to various university and holiday constraints.

Note that every topic of each week below includes regular practice problems with unlimited additional practice, lecture videos to present the concepts, and textual descriptions for those that prefer text over video; all as outlined in the online coursework section above.

Module 1: Orientation, Review and Needs Assessment

This is a self-driven review of content that students should have already mastered before enrolling in this course, and it culminates in a Needs Assessment - an online quiz with unlimited attempts that does not count toward the final grade - but a sufficient score is required (representing sufficient mastery of the prerequisite material) before moving onto the next module.

Week 1: Review of Arithmetic and Algebra, Introduction to Mathematical Reasoning, Applying Mathematical Reasoning to Numeric Models.

This covers what variables are, how to problem solve, and the basics of numeric literacy and computation.

Module 2: Universal Objects and Properties

Module 2 is aimed to provide general properties and ideas that apply to all function types, and to set the stage for most of the rest of the semester.

You can find the Xronos content here - although remember that you should always log in via the Canvas link to ensure your grade is updated and you get credit for the work you do.

Week 2: Introduction to Functions; Domains, Range, CoDomains, Notation, and Composition. Introduction to Graphing.

In this lesson, we review the basics and establish a deeper understanding of functions and graphing. This includes a practical concept of domain, codomain, and range, as well as the formal mathematical language used to express these things abstractly. We also begin our investigation of graphs, including their strengths and weaknesses.

Week 3: Continue Introduction to Graphing, Library of Functions.

In this lesson, we cover what graphing should (and shouldn't) be used for, how to tell if a graph represents a function, and arguably the most important part of the graphing content: the library of functions!

Week 4: Translations and Transformations of functions.

In this lesson, we begin our true investigation of universal techniques for functions by tackling rigid translations and transformations. We also discuss the virtue of geometrical and analytic perspectives as compliments rather than opposites.

Week 5: Points of Interest; Zeroes, Intercepts. Algebraic Manipulation of Functions, Inverse Functions.

As we conclude the module, we cover many of the properties that are almost always of interest for a function - regardless of function type. This includes things like intercepts, continuity and discontinuity, inverse functions, and why the numbers "0" and "1" are so useful in mathematics.

Module 3: Exploration of Functions One:

In part one of the exploration of functions, we do a deep dive into the mechanics and techniques involved in polynomials, radical functions, and inequalities.

You can find the Xronos content here - although remember that you should always log in via the Canvas link to ensure your grade is updated and you get credit for the work you do.

Week 6: Polynomials; Introduction and definitions.

In this lesson, we begin our deep dive into polynomials with a discussion on what exactly a polynomial is and some fundamental properties of polynomials in general.

Week 7: Polynomials: Factoring Methods.
In this lesson, we begin our deep dive into factoring techniques, covering common factors, factoring coefficients, the AC-method, factor by grouping, special forms of polynomials, and completing the square.

Week 8: Polynomials: Synthetic and Long Division, Complex Numbers.
In this lesson, we conclude our deep dive into polynomials by discussing some advanced techniques for factoring, like polynomial division and synthetic division and the rational root theorem. We finish off our section with a discussion on complex numbers - what they are, why they are important for polynomials, and how to manipulate them.

Week 9: Radical Functions.
In this lesson, we proceed to do a deep dive on radical functions, covering how to algebraically manipulate them and the various functional aspects we need to recognize about them.

Week 10: Inequalities.
In this lesson, we do our deep dive on inequalities, including what they are, how to graph them, and how to algebraically manipulate and solve them.

Module 4: Exploration of Functions Two:
In part two of the exploration of functions, we do a deep dive into the mechanics and techniques involved in exponential functions, logarithmic functions, piecewise functions, absolute value functions, and rational functions.
You can find the Xronos content here - although remember that you should always log in via the Canvas link to ensure your grade is updated and you get credit for the work you do.

Week 11: Exponential Functions.
In this lesson, we do a deep dive into exponential functions - including their properties, how to simplify/expand them, and models of exponential growth and decay.

Week 12: Logarithmic Functions.
In this lesson, we do our deep dive into logarithmic functions - including their useful properties, where they come from, and how to manipulate/solve equalities involving logarithms.

Week 13: Piecewise Functions.
In this lesson, we do our deep dive into piecewise functions - including their useful properties, why they are useful, and how to compute and graph piecewise functions.

Week 14: Absolute Value Functions.
In this lesson, we do our deep dive into absolute value functions - including their useful properties, where they come from, how/why they are used, and how to manipulate/solve equalities involving absolute values.

Week 15: Rational Functions.
In this lesson, we do our deep dive into rational functions - including their useful properties, and how to manipulate/solve equalities/expressions of rational functions.

Week 16: Review and Catchup

The above is a general week by week outline of intended content coverage, but for the most updated dates and timeline, please refer to the module assignment breakdown in Canvas. Also note that, due to holidays or breaks, the last week is often injected as a break week during semester, rather than a review week at the end of the course.