Syllabus
Math 115: Precalculus
Section T01 Fall 2022

Instructor: Jack Dalton
Office: LeConte 121
Office Hours: M 3:30-4:30, TR 3:30-4:00 in my office, W 3-4 in LeConte 102, or by appointment
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SI Leader: Blaise Moses
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SI Session Attendance Policy: You must attend one SI session per week for at least 9 weeks of the semester. You will lose one percentage point off your final grade for each week less than 9 that you attend an SI Session. If you do not attend any, you will lose almost a full letter grade.

Class Meetings: TuTh 4:25-5:40 PM in Petigru 213 and MW 5:30-6:20 PM in Petigru 101

Textbook and Materials: *Precalculus: A Unit Circle Approach (4th Ed), Ratti, McWaters, and Skrzypek*. This can be either a physical copy or the ebook version found in our homework system, MyMathLab. All students need an access code for MyMathLab for their homework. In addition, students need access to a computer, a method to create pdf's, and may find a calculator helpful at times (A graphing calculator is good but optional here. You should avoid a calculator with a computer algebra system).
Prerequisite: Qualification through placement exam, or a grade C or better in MATH 111/111i.
Bulletin Description: Topics in algebra and trigonometry specifically needed for MATH 141, MATH 142, MATH 241. Subsets of the real line, absolute value; polynomial, rational, inverse, logarithmic, exponential functions; circular functions; analytic trigonometry.
Learning Outcomes: A student who successfully completes Precalculus (Math 115) should continue to:

- Increase their skills with algebra and trigonometry. Note that algebra skills are an important prerequisite for precalculus. Not all mistakes are created equal. You cannot begin many precalculus problems without necessary algebra skills.
- Work with mathematical terms such as linear, quadratic, exponential, logarithmic, inverse polynomial, rational, circular, and trigonometric functions and express these terms in correct context.
- Apply the methods of algebra to solve applications involving intercepts, rates of change, inequalities, systems of equations, rational functions, and interest growth.
- Develop various properties graphically and formulaically (domain, range, inverse functions, unit circle, Pythagorean identities, reciprocals, half-angle identities, double angle identities, and transformations)
- Students will tackle problems that require more than one step to solve. *This can be challenging because you may want to draw on external sources for help, but strive to be patient and give your brain a fair and just attempt. I like to think of these problems as puzzles, where we build the tools we can apply to them in class.*

Expectations: Students are expected to read assigned sections in the text and complete periodic homework assignments and quizzes. Students should check email and Blackboard frequently for announcements and posted course documents such as solutions and worksheets.

Grade Distribution:		**Grading Scale:**			
Homework	20%	A	90%-100%	C	70%-76%
Quizzes	10%	B+	87%-89%	D+	67%-69%
Tests (3 In-Class)	45%	B	80%-86%	D	60%-66%
Final Exam	25%	C+	77%-79%	F	below 60%

Attendance Policy: Attendance policies will follow university guidelines. Attendance will be taken each class and a seating chart may be enforced in order to facilitate university contact tracing. Please take precautions to minimize the risk of spreading COVID-19. In addition to this, students that miss class should be proactive in contacting your instructor with supporting documentation and setting up make-up options for missed work in a timely manner, typically within 24 hours. For example, do not wait until the next time you come to class. Students are ultimately responsible for catching up with any missed material or announcements.

Testing Policy: There will be three writen exams during the semester. Testing dates are given below. Exact material for each exam will be announced in class before the exam date. A make-up test will only be given in an extreme situation and will require written documentation. No exams will be dropped, but exam correction points are available. If students come to office hours and present on a whiteboard solutions to questions they got wrong, they will earn back half the lost points. If a student cannot figure out a question they got wrong on their own, that is fine, as long as it is clear to the instructor that they attempted the problem before the meeting. A student can earn points back in this way for only one assignment per office hour.

Homework Policy: Homework assignments will be given throughout the semester through MyMathLab (mymathlab.com). Additional instructions for getting set up in MyMathLab are posted on Blackboard. It is highly recommended to have assignments completed before the due date to leave time to resolve any questions that may occur. Students may discuss homework assignments with each other, but it is the responsibility of the individual student to learn and understand the course material. **Homework presentations** will occur most class periods and each scholar is expected to present **three** times before the end of the semester. I will ask for volunteers at the end of each class period to present a homework problem of their choice from the section we covered that day. At the beginning of the following class, the presenter will write both a question and solution on the white board and explain their work to the class. Each presentation should be less than 5 minutes.

Quiz Policy: Short written quizzes will be given periodically. These are designed to help students receive feedback on their notation and on their work justifying their final answers. Appropriate written documentation must be provided to make up any missed quiz. Quiz correction points are available, but the same rules listed above under Testing Policy apply.

Getting Help: Students are encouraged to attend office hours or schedule appointments if particular difficulties arise. In this course, the subject matter builds upon itself, so it is important to catch gaps in understanding early. Students should also be aware of the Math Tutoring Center (www.math.sc.edu/math-tutoring-center) and of the Student Success Center satellite locations in residence halls and online (http://sc.edu/success). Help is also available through supplemental instruction. The full schedule for SI sessions is available online. Even if you cannot make your SI leader's sessions, you can attend sessions for other SI leaders.

Disability Services: Any student with a documented disability should contact the Office of Student Disability Services at 803-777-6142 to make arrangements for appropriate accommodations. Please let me know anything that I need to know to be able to properly make accommodations.

Honor Code: The Honor Code applies to all work for this course. Students should review the Honor Code at http://www.sc.edu/academicintegrity. Students found violating the Honor Code will be subject to discipline.

Technology Policy: Unless specifically requested by the instructor, cell phones are to be away (not in view), and with sound turned off during class. Cell phones are not just a distraction to the person using them, but also to those around them. If you need to use your cell phone in an emergency, please do so in the hallway.

Cumulative Final Exam: Thursday, December 8 at 4:00 PM in Petigru 213

Important Dates:

Aug	18	First Day of Classes
Sep	5	Labor Day (No Classes)
Sep	22	Exam I covering Appendix A and Chapter 1
Oct	13-14	Fall Break (No Classes)
Oct	20	Exam II covering Chapters 2 & 3
Nov	2	Last day to withdraw without a grade of 'WF' being recorded
Nov	8	Election Day (No Classes)
Nov	22	Exam III covering Chapters 4 & 5
Nov	23-27	Thanksgiving Break (No Classes)
Dec	2	Last Day of Classes
Dec	8	Final Exam (cumulative) at 4:00 PM in Petigru 213

Weekly Schedule:
The following is a *tentative* weekly schedule of topics and subject to change based on our needs.

Week	Sections	Topics
0 & 1	Syllabus, A.1, A.2, A.3	Real Numbers, Exponents, Polynomials, Rational Expressions
2	A.4, A.6, A.7	Radicals, Equations, Inequalities
3	1.1, 1.2, 1.3	The Coordinate Plane, Graphs of Equations, Lines
4	1.4, 1.5, 1.7	Functions, Transformations of Functions
5	1.8, 1.9, Review, Exam I	Combining Functions, Compositions, Inverse Functions
6	2.1, 2.2, 2.3	Quadratic Functions, Polynomials, Dividing Polynomials and Rational Zeros Test
7	2.4, 2.5, 2.6	Rational Functions, Polynomial and Rational Inequalities, Polynomial Roots
8	3.1, 3.2, 3.3	Exponential Functions, Logarithmic Functions, Logarithm Rules
9	3.4, 3.5, Review, Exam II	Exponential and Logarithmic Equations and Inequalities, Logarithmic Scales and Modeling
10	4.1, 4.2, 4.3	Angles, Unit Circle and Trig Functions of Real Numbers, Trig Functions of Angles
11	4.4, 4.5, 4.6	Graphs of Trig Functions, Inverse Trig Functions
12	5.1, 5.2	Trig Identities, Sum/Difference Formulas
13	5.3, 5.4, 5.5	Double Angle and Half Angle Identities, Product-to-Sum and Sum-to-Product Formulas, Trig Equations
14	Review, Exam III	
15	6.1, 6.2, 6.3, Review	Right Triangle Trigonometry, Law of Sines, Law of Cosines

Strategies for Success in This Course

For many, math can be a stressful subject to learn. Here are some tips and strategies that may make things a bit easier for you.

- Getting the correct final answer is important, but it is not enough just to have this. You must also justify why your answer is correct through your work.
- Help me understand what you understand. If you get stuck on a problem, writing out what you would do if you could get unstuck is often worth partial credit. It is perfectly fine for your math work to have actual sentences in it.
- Learning is a marathon, not a sprint. Try to work with our material a short time every day instead of waiting until a deadline is looming. The additional stress of a deadline will make things harder than they have to be. A good rule of thumb is to spend about two hours outside of class working with our material for every hour you spend in class.
- Homework is meant to give you a chance to stretch your abilities and make sure you are comfortable with our topics. This way, you can take the information we cover in class and apply it to problems you may not have seen before exactly. Don't rob yourself of this opportunity by letting a computer do your work instead.
- A lack of comfort with algebra skills is one of the major issues that students face in this class. One thing you can try if you are not sure an algebra trick works is to swap in more familiar numbers. For example,

  $$\frac{a}{b+c} \stackrel{?}{=} \frac{a}{b} + \frac{a}{c}$$

  Does this work if we swap a, b, and c with 1, 2, and 3 respectively?

  $$\frac{1}{2+3} = \frac{1}{5} \qquad \text{vs} \qquad \frac{1}{2} + \frac{1}{3} = \frac{5}{6}$$

  Since $\frac{1}{5}$ is not equal to $\frac{5}{6}$, we know that our proposed rule is incorrect.
- Studying for math exams may be different than the strategies you would use for other classes. Staring at the same problems over and over is usually only helpful to a certain point. Instead, you might try teaching others how to do problems. This way you can practice problems, explain why you do individual steps, and be able to answer questions on the fly from your audience. I recommend cycling between working on your own and taking turns teaching other students in our class how to do problems.
- Proper notation, e.g. equal signs or parentheses, is important. Be sure that you communicate exactly what you mean to communicate. Remember, I only get to see what you put on the paper; I can't see what you are thinking in the moment.
- Class attendance is essential. With the way that material builds upon itself, playing catch-up in a math class is much harder than learning with the class in the first place. In my experience, students that miss more than two or three classes tend to finish the class with about a letter grade lower than they probably could have achieved if they attended class. You should try to have as few absences as possible.