

COURSE SYLLABUS

YEAR COURSE OFFERED: 2016 – 2017

SEMESTER COURSE OFFERED: Fall

DEPARTMENT: MATH

COURSE NUMBER: 1330 (This information applies to all sections)

NAME OF COURSE: Precalculus

NAME OF INSTRUCTOR: Moses Sosa
<https://www.math.uh.edu/~mmsosa>

The information contained in this class syllabus is subject to change without notice. Students are expected to be aware of any additional course policies presented by the instructor during the course.

Instructor information:

- Instructor: M o s e s S o s a
- Office: PGH 617
- Office/conference Hours: b y a p p o i n t m e n t
- Email: mmsosa@math.uh.edu

PREREQUISITES: MATH 1310: College Algebra or a passing score on the test for placement out of College Algebra.

Math 1330 is a course for students who have Calculus I in their degree plan. As such, the following rules apply to this course:

No calculators to be used on homework, quizzes, or tests*.

No opt-out on the final; the final is mandatory for all students.

Please see an advisor to check about Calculus being in your degree plan. If it is not there, please take Math 1311 and Math 2311 as your core and reasoning.

*if you have calculator use on a SAF form, please take Math 1311 and Math 2311.

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TEXTBOOK

The textbook, online quizzes, and additional help materials will be made available by logging into CourseWare at <http://www.casa.uh.edu>. The first portion of these materials are freely available for the first two weeks of class. **Students are required to purchase an access code at the UH Book Store to access the learning materials by the end of the second week of school.**

The information contained in this class outline is an abbreviated description of the course. Additional important information is contained in the departmental policies statement at <http://www.mathematics.uh.edu/undergraduate/courses/math13xx/> and at your instructor's personal webpage. You are responsible for knowing all of this information. Note that some 13xx policies do not apply to 1330 (for instance; no exemption/optout from the final in Math 1330).

COURSE OBJECTIVES FOR PRECALCULUS

When you successfully complete this course, you will be able to:

1. Recall and apply basic algebra skills without requiring a review.
2. Recognize various kinds of functions (including polynomial, rational, radical, exponential, and logarithmic functions), analyze their behavior, and use the properties of these functions to solve equations and application problems.
3. Define trigonometric functions; understand the right triangle trigonometry and unit circle.
4. Know and apply identities involving the trigonometric functions.
5. Recognize the conic sections and their geometric properties.
6. Exploit graphical and analytical techniques in solving problems.
7. Analyze and explain the important elements of the mathematical solution of equations.
8. Recognize and use the vocabulary of vectors (vector, scalar, magnitude, direction) to perform arithmetic on vectors and to solve application problems.
9. Recognize polar coordinates and use them to draw graphs and plot points.
10. Be self-disciplined and dependable through daily consistent work.

ASSESMENTS

A student in this class is expected to complete the following assignments:

1. Course Policy Quiz – online on your CASA account – **you must make 100% on the course policy quiz in order to have access to the other online assignments in the course.** The answers to the quiz may be found in the “Math 13xx Course Policies” document on your instructor's website.
2. 4 Regular Exams
3. Final Exam
4. Online Quizzes
5. Homework
6. Poppers – in-class quizzes given daily starting the 3rd week of classes.

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Components and Weights of Semester Assignments:

Test 1	5%
Test 2	15%
Test 3	15%
Test 4	15%
Final Exam	20%
Homework	10%
Poppers	10%
Online Quizzes	10%
Total:	100%

Note: The percentage grade on the final exam (without extra credit) can be used to replace your lowest test score if it is better than your lowest test grade.

GRADING SCALE

University of Houston standard grading scale will be used to determine your letter grade in this course.

EXAM INFORMATION

There will be 4 tests along with a mandatory final exam. The complete schedule is on your instructor's web page. All tests are taken at CASA testing center, with reservation.

Test 1 is over prerequisite material and will be taken at CASA Testing Center by reservation. Use "proctored exams" tab at your CASA account to reserve a seat for it. To see what to expect on Test 1, take "practice test 1" under the online assignments tab at CASA.

IMPORTANT: If you score low on Test 1 (below 60 without extra credit); you may consider dropping this course and taking the prerequisite course to prepare yourself for this course. If you decide not to drop, it is strongly recommended that you sign up for an SEP workshop designed for Math 1330 students; you can add a workshop in your PS account before the last day to add.

Exam topics: *(Any change on the exam topics will be announced on the instructor's website)*

Test 1	Prerequisite Material
Test 2	Algebra review, Chapter 4
Test 3	Chapters 5 and 6
Test 4	Chapters 7 and 8
Final	Comprehensive (covers all sections; including vectors and polar curves)

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To see the exam dates and topics covered, please visit your instructor's website. **You must make a reservation to take a test prior to the first testing day.** You should print out the web page showing your reservation time for your records and proof of your reservation. Reservation generally begins 2 weeks prior to an exam; reserve a seat as soon as the scheduler opens up.

Tests are 50 minutes long. Push the "submit" button when you're completely ready to leave the Testing Center, AFTER you've finished ALL the questions and checked your work.

If you miss a test, you receive a zero for it. When you take the final, the grade on the final will replace that zero. If you miss more than one test, only the first one will be replaced. There are no retakes or makeups in this class.

You can NOT use calculators during any of the exams; study accordingly.

Final Exam:

Final is comprehensive and mandatory for ALL students. **There is no "exemption" or "opt-out" from the final in Math 1330.** No make-ups/no excuses. **NO EARLY FINALS.** Check your instructor's website for final exam schedule. Final is given at CASA testing center. Reserve a seat for it when reservation begins. Your raw score on the final will be used to replace the lowest test score if it is better.

EXTRA CREDIT

There are practice tests and a practice final on Courseware. If you take the practice test, then 10% of the highest score you earn will be applied to the relevant test as extra credit on the corresponding exam. You can take the practice tests several times (up to 20 times) and we only take your best score. Pay attention to the "end" dates on these. None of the practice tests will ever be re-opened.

INSTRUCTIONS FOR QUIZZES

Online quizzes will be given regularly in this course.

- The quizzes are located in the CASA CourseWare course website under the "Online Assignments" tab.
- The quizzes will close on the due dates given on CourseWare at 11:59 pm and will not re-open.
- One of the lowest quizzes will be dropped.
- You have 20 times to take each quiz.
- There is a 60 minute time limit for each quiz.
- All of the quizzes are open starting the first day of classes.

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- Check your instructor's website to see the topics covered on each quiz.
- There may be 2 or more quizzes due every week; check the due dates carefully.

There will be **no makeup quizzes** for any reason. Neither I, nor the Math Department, is responsible for any difficulty that you have in accessing the quizzes. Please don't delay taking quizzes – there are times during the week when CourseWare is slow or overloaded. There is no amnesty period for the quizzes; the quizzes will NOT be reopened at the end of the semester. If you miss a quiz, you will NOT have a chance to make up for it. Please contact CourseWare tech support directly if you are having problems. The email link is on the CASA homepage.

INSTRUCTIONS FOR POPPERS

- For each lecture starting on the third week of classes you will be asked a series of problems that will have to do with the lecture.
- The forms are for sale at the BOOK STORE. Please buy the package for Math 1330 with **your section number printed on it**. You must use the right popper forms for credit; you can't turn in your answers on any other kind of paper.
- You are required to fill in your id number, popper number and blacken the correct circles. Make sure that your id number and popper number are correct before turning in the popper at the end of the lecture. If these are not filled out correctly or if the darkened circles are too light you will not get credit for that day's lecture even if you attended.
- The total number of questions for the course will be counted, 85% of the total number of questions will be the 100%. For example, *if* there are 5 questions each class for 24 classes, which is 120 questions. Your grade will be calculated out of $120(.85) = 102$ points.
- There will be **no make-up** Poppers.

If your popper is not graded even though you turned it in, that means you've made a bubbling mistake and there is nothing we can do about it, you will not receive credit for such poppers.

INSTRUCTIONS FOR HOMEWORK

- There are weekly assignments (multiple choice and/or written) due every week starting the third week.
- The homework problems and due dates will be posted on course website.
- For Electronic Homework (multiple choice): You will submit your answers using "EMCF" tab at CASA before the due date.
- For Written Homework: You will upload the completed homework as a PDF file on CASA under "assignments" tab before the due date. More information on how to upload homework will be provided on the course website. Students must follow these instructions to receive a grade on the homework; files uploaded incorrectly will not be graded.
- Two of the lowest homework assignment scores will be dropped.
- No late homework; no make ups on the homework.

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LATE ASSIGNMENT AND MAKE-UP POLICY

This course is a cumulative course. You as a student need to keep up with the reading, quizzes, homework assignments and exams. Thus, late work or make-ups will not be accepted for any reason.

CSD ACCOMMODATIONS

A current Student Accommodation Form (SAF) must be presented in a timely manner for accommodations to be approved. No retroactive accommodations will be provided.

Accommodations for undergraduate mathematics courses that could change the essential nature of the course or provide an unfair advantage to one student over another student will not be approved. Notably, in the event that calculators and/or formula sheets are allowed for all students in a course, then all students may have them. If, however, calculators and/or formula sheets are not allowed to anyone, then no one may have them. Accommodations that are listed on your SAF that would NOT change the essential nature of a course or provide an unfair advantage may be approved (e.g. an extra set of class notes for lecture, testing at CSD, extended time*).

Please review these with your teacher during the conference hours for the class (not immediately before or after a lecture).

*If you run over the agreed upon extended time you will be penalized in proportion to the amount over.

Whenever possible, and in accordance with 504/ADA guidelines, the University of Houston will attempt to provide reasonable academic accommodations to students who request and require them. Please call 713-743-5400 for more assistance.

The instructor reserves the right to make changes on these policies. Any changes will be announced on the instructor's website in a timely manner.

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Learning Objectives for Precalculus

1. Recognize various kinds of functions (including polynomial, rational, radical, exponential, and logarithmic functions), analyze their behavior, and use the properties of these functions to solve equations and application problems. Recognize that exponential and logarithmic functions are inverses, recall the characteristics of these functions, and solve equations and application problems involving exponential and logarithmic functions. Apply the concepts learned about limits at infinity to afore mentioned functions.

2. Recognize and use the vocabulary of angles (including standard position, initial and terminal sides, quadrantal angles, coterminal angles, acute, right, and obtuse angles).
Use degrees and radians to measure angles.
Convert angles from degrees to radians and vice versa.
Compute the length of a circular arc given the radius and the interior angle.
Apply the concepts of linear and angular speed to solve problems concerning motion on a circular path.

3. Use right triangles to evaluate the six trigonometric functions.
State the trigonometric function values for 30° , 45° , 60° . Use right triangle trigonometry to solve application problems that can be visualized using right triangles.

4. Compute the six trigonometric functions of any angle and use the unit circle to define the six trigonometric functions for all real numbers.
Define the trigonometric functions for any angle.
Identify the signs of the trigonometric functions.
Find reference angles and use them to evaluate trigonometric functions.
Identify even and odd trigonometric functions.

5. Know and draw the graphs of the six trigonometric functions and their variations.
Compute the amplitude, period, phase shift, vertical shift, domain, and range of a sinusoidal functions. Compute the period, domain, range, vertical asymptotes, and x-intercepts of the tangent and cotangent functions.
Draw the graphs of $y = \csc x$ and $y = \sec x$; recognize the relationship between the graph of a cosecant function (respectively, secant) and the graph of a sine (respectively, cosine) function.

6. Understand the definitions of the inverse trigonometric functions.
Compute the domain and range of the inverse trigonometric functions.
Evaluate inverse trigonometric functions using a calculator (*optional).
Find exact values of composite functions with inverse trigonometric functions

7. Know and apply identities involving the trigonometric functions.
Use trigonometric identities to simplify expressions and to evaluate the trigonometric functions.
Use the trigonometric functions to solve triangles.
Use fundamental trigonometric identities to verify other identities.

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Apply the sum and difference formulas for sine, cosine, and tangent.
Apply the double-angle and half-angle formulas for sine, cosine, and tangent.
Apply the Law of Sines and/or the Law of Cosines either to solve triangles.

8. Find all solutions of a trigonometric equation.
Solve trigonometric equations quadratic in form.
Use identities to solve trigonometric equations.

9. Recognize conic sections and their geometric properties.
Differentiate between four conic sections (circle, ellipse, hyperbola, parabola) using the standard and the general form of the equations.
Describe the terms center, foci, vertices, and directrix.
Graph the conic sections.
Solve non-linear systems with two variables using algebra and/or graphing.

10. Recognize and use the vocabulary of vectors (vector, scalar, magnitude, direction) to perform arithmetic on vectors and to solve application problems.
Draw the components of a vector.
Construct a visual representation of scalar multiplication, vector addition, and vector subtraction.
Find the dot product of two vectors; find the angle between two vectors.
Use the dot product to determine if two vectors are orthogonal, parallel, or neither.

11. Recognize polar coordinates and graph polar curves.
Define polar coordinates and be able to convert between Cartesian and polar coordinates.
Understand the basic curves in polar coordinates.
Graph in polar coordinates and use graphs to recognize parametric representations of polar equations.

Precalculus Topic List

Algebra Review: Functions

- Methods of Combining Functions
- Inverse Functions
- Polynomial and Rational Functions
- Exponential Functions
- Logarithmic Functions

Chapter 4: Trigonometric Functions

- Special Right Triangles and Trigonometric Ratios
- Radians, Arc Length and the area of a Sector
- Unit Circle Trigonometry
- Trigonometric Expressions and Identities

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Chapter 5: Graphing Trigonometric Functions

- Trigonometric Functions of Real numbers
- Graphs of the Sine and Cosine Functions
- Graphs of the other Trigonometric Functions
- Inverse Trigonometric Functions

Chapter 6: Trigonometric Formulas and Equations

- Sum and Difference Formulas
- The Double-Angle and Half-Angle Formulas
- Solving Trigonometric Equations

Chapter 7: Trigonometric Applications

- Solving Right Triangles
- Area of a Triangle
- The Law of Sines and The Law of Cosines

Chapter 8: Analytic Geometry

- Circles
- Ellipses
- Parabolas
- Hyperbolas

Additional Topics

- Vectors in the Plane
- Polar Coordinates and Polar Curves