

VC 12308 13S

CBM003 ADD/CHANGE FORM

APPROVED APR 24 2013

Undergraduate Council  
 New Course  Course Change  
 Core Category: Math/Reason Effective Fall ~~2013~~ 2014

or

Graduate/Professional Studies Council  
 New Course  Course Change  
 Effective Fall 2013

1. Department: Mathematics College: NSM  
 2. Faculty Contact Person: Charles Peters Telephone: 743-3516 Email: charles@math.uh.edu

3. Course Information on New/Revised course:  
 • Instructional Area / Course Number / Long Course Title:  
MATH / 1330 / Precalculus  
 • Instructional Area / Course Number / Short Course Title (30 characters max.)  
MATH / 1330 / PRECALCULUS  
 • SCH: 3.00 Level: FR CIP Code: 27.0101.00.01 Lect Hrs: 3 Lab Hrs: 0

RECEIVED APR - 4 2013

4. Justification for adding/changing course: To meet core curriculum requirements  
 5. Was the proposed/revised course previously offered as a special topics course?  Yes  No

If Yes, please complete:

- Instructional Area / Course Number / Long Course Title:  
 \_\_\_ / \_\_\_ / \_\_\_  
 • Course ID: \_\_\_\_\_ Effective Date (currently active row): \_\_\_\_\_

6. Authorized Degree Program(s): \_\_\_\_\_  
 • Does this course affect major/minor requirements in the College/Department?  Yes  No  
 • Does this course affect major/minor requirements in other Colleges/Departments?  Yes  No  
 • Can the course be repeated for credit?  Yes  No (if yes, include in course description)

7. Grade Option: Letter (A, B, C ...) Instruction Type: lecture ONLY (Note: Lect/Lab info. must match item 3, above.)

8. If this form involves a change to an existing course, please obtain the following information from the course inventory: Instructional Area / Course Number / Long Course Title  
MATH / 1330 / Precalculus  
 • Course ID: 31098 Effective Date (currently active row): 8272012

9. Proposed Catalog Description: (If there are no prerequisites, type in "none".)  
 Cr: 3. (3-0). Prerequisites: Credit for or placement out of MATH 1310 Description (30 words max.):  
 Students with prior credit in MATH 1432 may not receive credit for MATH1330. Functions, graphs, trigonometry, and analytic geometry.

10. Dean's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Print/Type Name: \_\_\_\_\_

## REQUEST FOR COURSES IN THE CORE CURRICULUM

Originating Department or College: Department of Mathematics

Person Making Request: Charles Peters

Telephone: 713-743-3516

Email: charles@math.uh.edu

Dean's Signature: \_\_\_\_\_

Date: 2/13/2013

Course Number and Title: MATH 1330: Precalculus

Please attach in separate documents:

Completed CBM003 Add/Change Form with Catalog Description

Syllabus

List the student learning outcomes for the course (Statements of what students will know and be able to do as a result of taking this course. See appended hints for constructing these statements):

Students will be able to apply algebraic rules and transformations to simplify or elaborate on mathematical expressions. Students will understand and be able to apply methods of solution of polynomial, rational, and trigonometric equations and will understand the properties of solutions of such equations. Students will be familiar with properties of conic sections and other elementary curves and will be able to simultaneously exploit graphical and analytical techniques in solving problems. They will be able to translate ordinary language descriptions of a problem into mathematical expression and explain in English the important elements of a mathematical solution.

Component Area for which the course is being proposed (check one):

**\*Note:** If you check the Component Area Option, you would need to also check a Foundational Component Area.

Communication

American History

Mathematics

Government/Political Science

Language, Philosophy, & Culture

Social & Behavioral Science

Creative Arts

Component Area Option

Life & Physical Sciences

Competency areas addressed by the course (refer to appended chart for competencies that are required and optional in each component area):

Critical Thinking

Teamwork

Communication Skills

Social Responsibility

Empirical & Quantitative Skills

Personal Responsibility

Because we will be assessing student learning outcomes across multiple core courses, assessments assigned in your course must include assessments of the core competencies. For each competency checked above, indicated the specific course assignment(s) which, when completed by students, will provide evidence of the competency. Provide detailed information, such as copies of the paper or project assignment, copies of individual test items, etc. A single assignment may be used to provide data for multiple competencies.

**Critical Thinking:**

Several examples of exercises and assignments addressing critical thinking competencies are attached.

**Communication Skills:**

See attached.

**Empirical & Quantitative Skills:**

See attached.

**Teamwork:**

Click here to enter text.

**Social Responsibility:**

Click here to enter text.

**Personal Responsibility:**

Click here to enter text.

Will the syllabus vary across multiple section of the course?  Yes  No

If yes, list the assignments that will be constant across sections:

Click here to enter text.

Inclusion in the core is contingent upon the course being offered and taught at least once every other academic year. Courses will be reviewed for renewal every 5 years.

The department understands that instructors will be expected to provide student work and to participate in university-wide assessments of student work. This could include, but may not be limited to, designing instruments such as rubrics, and scoring work by students in this or other courses. In addition, instructors of core courses may be asked to include brief assessment activities in their course.

Dept. Signature: \_\_\_\_\_

The following courses have been reviewed and approved by the NSM Curriculum Committee to meet the new core requirements. Given the length of the individual submissions I have elected to submit these requests by electronic means only.

**Natural Sciences: Core Courses**

BIOL 1309 - Human Genetics and Society

BIOL 1310 - General Biology

BIOL 1320 - General Biology

BIOL 1361 - Introduction to Biological Science I

BIOL 1362 - Introduction to Biological Science II

CHEM 1301 - Foundations of Chemistry

CHEM 1331 - Fundamentals of Chemistry I

CHEM 1332 - Fundamentals of Chemistry II

GEOL 1302 - Introduction to Global Climate Change

GEOL 1330 - Physical Geology

GEOL 1340 - Introduction to Earth Systems

GEOL 1350 - Introduction to Meteorology

GEOL 1360 - Introduction to Oceanography

GEOL 1376 - Historical Geology

PHYS 1301 - Introductory General Physics I

PHYS 1302 - Introductory General Physics II

PHYS 1321 - University Physics I

PHYS 1322 - University Physics II

**Mathematics: Core Courses**

MATH 1310 - College Algebra

MATH 1311 - Elementary Mathematical Modeling

**Math/Reasoning: Core Courses**

COSC 1306 - Computer Science and Programming

MATH 1330 - Precalculus

MATH 1431 - Calculus I

MATH 1432 - Calculus II


MATH 2311 - Introduction to Probability and Statistics

**Writing in the Disciplines: Core Courses**

BCHS Biochemistry Lab II

BIOL 3311 - Genetics Lab

PHYS 3313 - Advanced Lab I

  
~~Ian Evans~~  
Associate Dean

4/4/13

## Spring 2013 - Math 1330 Course Syllabus

Section: 13191

Instructor name: Dr Melahat Almus  
Website: [www.math.uh.edu/~almus](http://www.math.uh.edu/~almus)  
Email: [almus@math.uh.edu](mailto:almus@math.uh.edu)  
Conference hours: Check the instructor's website.

### Course Learning Materials:

You do not need to purchase a textbook for Math 1330. The textbook, online quizzes, EMCF assignments, and additional help materials will be made available by logging into *CourseWare* at <http://www.casa.uh.edu>. The first portion of these materials is freely available for the first two weeks of class. All students must purchase a **Course Access Code** and enter it on *CourseWare* by the first day of the third week of class to continue accessing the course learning materials. A **Course Access Code** can be purchased from the University Bookstore.

### Course Objectives:

The student will master the following:

- Polynomial and Rational Functions
- Trigonometric Functions
- Graphing Trigonometric Functions
- Trigonometric Formulas and Equations
- Trigonometric Applications to Triangles
- Analytic Geometry

### 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, including Test 1.** 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 (14 quizzes)
5. Homework – on each section covered in class
6. Poppers – in-class quizzes given daily starting the 3<sup>rd</sup> week of classes.

### Components and Weights of Semester Assignments:

Test 1	10%
Test 2	15%
Test 3	15%
Test 4	15%
Final Exam	15%
Homework	10%
Poppers	10%
Online Quizzes	10%

### Grading Scale:

If you call your average “x”:

A $93 \leq x \leq 100$	B- $80 \leq x < 83$	D+ $67 \leq x < 70$
A- $90 \leq x < 93$	C+ $77 \leq x < 80$	D $63 \leq x < 67$
B+ $87 \leq x < 90$	C $73 \leq x < 77$	D- $50 \leq x < 63$
B $83 \leq x < 87$	C- $70 \leq x < 73$	F $0 \leq x < 50$

### Online Quizzes:

Online quizzes will be given weekly in this course, starting the first week of classes. You may take each up to 20 times during the time that it’s available. Your highest score is retained as the score for that quiz.

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.



### **Poppers:**

Beginning with the third week of school, I will give daily poppers... short questions on the material from that day's lecture or from the lecture just prior to the one we're having. Each popper will be taken on a bubbling form. I will drop 4 lowest popper scores. Popper grades will be posted in your CourseWare gradebook. There will be **no make-up** Poppers. The forms are for sale at the BOOK STORE. Please buy the package for Math 1330 with your section number printed on it.

**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.**

### **Homework:**

Homework is assigned for each section. In general, when a section is finished, the corresponding homework will close the next day at midnight. You need to submit your homework via your CASA account. Please see the link for Homework on your instructor's website for due dates and more detailed information. NO late homework. We will drop 4 assignments at the end of the semester.

### **Exams:**

There will be 4 exams, along with a mandatory final exam. The complete schedule is on your instructor's web page.

**Test 1 is online;** you can take it anywhere. You have 2 attempts for it (we take the better score). Test 1 covers the prerequisite material.

All the other tests are taken at CASA testing center, with reservation.

To see the exam dates and topics covered, please visit the "Quiz / Test Schedule" link on 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.

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 the tests; study accordingly.

### **Final Exam:**

Final is comprehensive and compulsory unless you're eligible for an exemption. Final is in our classroom. You need to bring a popper scantron for the final.

No make-ups/no excuses. **NO EARLY FINALS**

### **Final Exam Exemptions:**

If a student has a cumulative average of 80 or higher as calculated by the official department Grade Calculator at the end of the semester, that student may choose to be exempt from the final exam. A student must claim the exemption in his or her CASA account by the time specified on their instructor's website. If the exemption is taken, the student's final grade will be the grade determined by the Grade Calculator at the time the student claims an exemption according to the grading scale above (no rounding up).

Students who are not exempt from the final, or choose not to take the exemption to possibly improve their grade **MUST** take the final. The final exam is comprehensive.

### **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. 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.

### **Cell Phones and Laptops:**

Cell phones should be put into silent mode during the lecture. **Texting during the lecture is not allowed.**

**You can NOT use laptops during the lecture.**

### **Course Policies**

You can find the Course Policies on your instructor's website, under "Math 13xx – Course Policies" link. You are responsible for knowing these policies. Read them carefully, and make sure you understand all of them. Pay particular attention to the Homework policy, Quiz policy, Test policy and Final Exam policy. You may be asked popper questions over these policies.

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.

**Math 1330**  
**Precalculus**  
**Core Curriculum Report**  
**Fall 2012**

**Central Course Goal**

This course is designed primarily for majors in technical fields who plan to go on to the calculus sequence. It provides an in depth review of algebra, plane and analytical trigonometry, and analytic geometry.

**Precalculus Topic List**

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Functions

- Definition and Graphs
- Techniques in Graphing
- Methods of Combining Functions
- Inverse Functions

Polynomial and Rational Functions

- Linear Functions
- Quadratic Functions
- Applied Functions – Setting up Equations
- Polynomial Functions
- Rational Functions

Conic Sections

- Parabolas
- Ellipses and Hyperbolas

Trigonometric Functions of Angles

- Trigonometric Functions of Acute Angles
- Algebra and the Trigonometric Functions
- Right-Angle Trigonometry
- Trigonometric Functions of Angles
- Trigonometric Identities

Trigonometric Functions of Real Numbers

- Radian Measure
- Radian Measure and Geometry
- Trigonometric Functions of Real numbers

Graphs of the Sine and Cosine Functions  
Graphs of  $y = A \sin(Bx - C)$  and  $y = A \cos(Bx - C)$   
Graphs of the Tangent and the Reciprocal Functions

Analytical Trigonometry

The Addition Formula  
The Double-Angle Formula  
Trigonometric Equations  
The Inverse Trigonometric Equations

Additional Topics in Trigonometry

The Law of Sines and The Law of Cosines

Below are some representative questions from various assessment pieces that demonstrate our commitment to these objectives.

**Part A: Critical Thinking Skills**

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Developing and deepening **Critical Thinking Skills** is a large part of a student's successful completion of Math 1330. To this end, when we assess a student's work, we use both multiple choice questions and free response questions.

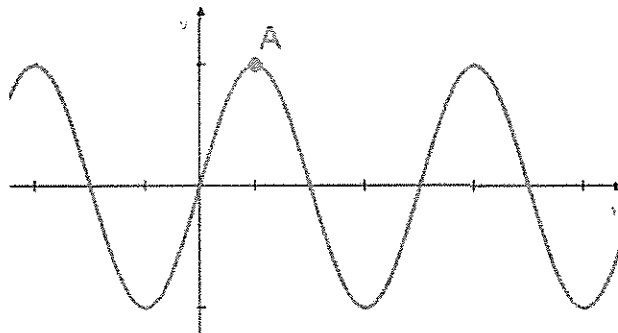
**Test 2 Question 1**

The graph of the given function has a horizontal asymptote. If the graph crosses this asymptote, give the x-coordinate of the intersection. Otherwise state that the graph does not cross the asymptote.

This question has a quantitative skill part – the manipulation that shows if the graph crosses or not. And requires the student to interpret the information from the manipulation. A nonsense answer like “ $5 = 12$ ” is possible and indicates that the graph does not cross.

### Test 3 Question 16

Given the following sine curve and the fact that point A has coordinates  $(\frac{\pi}{8}, 5)$ , what is the equation in terms of sine that produces this graph?



This question requires the utmost in pattern recognition skills and the use of a fairly complicated formula statement. It is an excellent question testing if the student actually knows the material well enough to use it creatively.

### Test 4 Question 6

Solve the following equation on the interval  $[0, 2\pi)$

$$4\cos^2 \theta + 3\cos \theta - 7 = 0$$

The student must transition mentally from equations in one variable to equations in FUNCTIONS of one variable, and then work within the given boundaries. This is a difficult question for immature math students.

## Part B: Communication Skills

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**Communication Skills** are important in this course. We constantly stress the notion of being aware of what is being asked and how to effectively interpret an answer after the algebraic manipulation of the numbers and symbols.

### Test 2 Question 2

Find the domain of the given function.

This question combines quantitative skill and the ability to communicate the answer in mathematical notation.

### Test 2 Question 13

Given the following function,

- A State the translation of the key point.
- B Graph the function on the coordinate plane that is given below.
- C State the range of the function.
- D Is the function one-to-one?

This is one of the free response questions. It requires that a student recognize the transformations given and apply them to the key point of the function. Graphing is a key skill in Math 1330. Finding the range is always a challenge to the students and knowing all about “one-to-one” functions is very important.

### Test 3 Question 12

Which of the following characterizes the horizontal shift of the graph of

$$y = 11 \cos\left(\frac{t}{3} + \frac{\pi}{27}\right)$$

The student must understand the nature of horizontal shifts for trigonometric functions and be able to formulate the answer in appropriate notation.

### Test 4 Question 10

ABC is a triangle with  $AB = 6$ ,  $BC = 5$ , and  $AC = 4$ . Find  $\cos(A)$ .

This is all about being able to read the question and realize exactly what is being requested. Incautious students invariably get confused and are solving for “A” not “ $\cos(A)$ ”. We are communicating clearly...but can the student see that?

## Part C: Empirical and Quantitative Skills

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**Empirical and Quantitative Skills** are the essence of the basics of this course. We have many questions that focus on manipulation of data and facts.

### Test 2 Question 4

Given the following functions, find  $(f \circ g)(x)$

This question has a specific algorithm for performing the operation. As one of the functions is always a rational function, the question is very challenging for students.

### Test 3 Question 2

A car has wheels with a 14 inch radius. If each wheel's rate of turn is 4 revolutions per second, how fast is the care moving in units of inches/sec?

An application question that leads directly to calculus. It combines units analysis and understanding the difference between angular and linear velocity.

### Test 3 Question 5

Find three angles, two positive and one negative, that are coterminal with the given angle:  
 $-50^\circ$

Another application question, leading to physics/dynamics studies. The student must understand the concept of coterminal and negative rotations.

### Test 3 Question 13

Write a sine function with a positive vertical dilation, given the amplitude is 6, the horizontal shift is 9 to the left, the vertical shift is 7 down, and the period is 3.

This is a challenging question for most students. It requires translating from the physical directions and dimension to an expression that relays the information in a compressed format.

### Test 3 Question 14

The voltage  $V$  produced by an alternating current generator is

$$V(t) = 389 \sin(130\pi t)$$

What are the amplitude and period of the voltage?

This question requires a solid understanding of the properties mentioned and the ability to pick them out of a formula.

### Test 4 Question 1

Which of the following is equivalent to  $\frac{2 - \cot^2 \theta}{1 + \cot^2 \theta} + 3 \cos^2 \theta$  .

This question is really a matter of using algebraic substitutions and identities to simplify the statement making it much easier to work with in the upcoming calculus class.