



# Houston Community College

## Course Syllabus

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### College Precalculus / Precalculus B

**SYLLABUS FOR MATH 2412 CRN: 78332**

**Instructor:** Warren Morales

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**Meeting Times:** Tuesdays/Thursdays, 12:30 – 2:00; Every Other Friday, 10:00 – 10:55

**W Date:** Thursday, April 21, 2011, 4:30 pm (Last Date to Withdraw with grade of W)

**Holidays:** Monday, March 14, 2011 – Friday, March 18, 2011 (Spring Break)

**TAKS Testing:** Tuesday, March 1, 2011

Tuesday, April 26, 2011; Thursday, April 28, 2011

**Final Exam:** Thursday, May 12, 2011, 12:00 – 2:00

**Catalog Description:** Precalculus. Topics include elementary theory of functions and equations, analytic geometry, vectors, introductory logic, mathematical induction, sequences and finite series. 4 credits. (4 lecture).

**Prerequisites:** Math 1314: Pass with a “C” or better.

Math 1316: Pass with a “C” or better.

**Course Intent:** This course is intended primarily to prepare students for calculus course. It can also be used for general mathematics credit.

**Audience:** This course is for students who need a background for taking a beginning calculus course.

**Course Objectives:** Upon completion of this course, a student should be able to:

1. Describe characteristics of functions (verbally, graphically, numerically, symbolically)
2. Develop and use various problem-solving techniques.
3. Investigate concepts of continuity, end behavior, asymptotes, and limits.
4. Review synthetic division.
5. Develop partial fraction decomposition.
6. Find the zeros of real functions.
7. Solve polynomial equations.
8. Use vectors to model physical situations.
9. Apply the law of cosines and the law of sines for various situations.
10. Name points in coordinate geometry using polar coordinates.
11. Recognize geometric formulas relating to circles, parabolas, ellipses, and hyperbolas.
12. Use the Binomial Theorem.
13. Recognize the use of arithmetic and geometric sequences and series.
14. Understand mathematical induction.

**COURSE OUTLINE**

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**Unit I – Trigonometry (Review)**

This unit includes Graphs of Trigonometric Functions, Inverse Trigonometry, Fundamental Identities, Sum and Difference Formulas, Half-Angle and Double-Angle Formulas, Solving Trigonometric Equations, Law of Sines, Law of Cosines, Polar Coordinates, and Graphing Polar Equations

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**Unit II – Trigonometry and Vectors**

This unit includes Vectors, Dot Product, and Systems of Equations

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**Unit III – Algebra**

This unit includes Graphs and Graphing Utilities, Polynomial and Synthetic Division, and Partial Fraction Decomposition.

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**Unit IV – Conics**

This unit includes Conics (Parabolas, Circles, Ellipses and Hyperbolas) and Parametric Equations.

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**Unit V – Sequences and Induction**

This unit contains Sequences and Summation Notation, Arithmetic Sequences, Geometric Sequences, Mathematical Induction, and the Binomial Theorem.

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**Unit VI – Introduction to Calculus**

This unit contains Limits using Tables and Graphs, Properties of Limits, One-Sided Limits, and Continuous Functions.

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**Resource Materials:** Any student enrolled in Math 2412 at HCCS has access to the Academic Support Center where they may get additional help in understanding the theory or in improving their skills. The Center is staffed with mathematics faculty and student assistants, and offers tutorial help, video tapes and computer-assisted drills. For more information and for tutoring hours and locations, go to the math department web page at <http://swc2.hccs.edu/math/>, and select the tutoring link.

**Americans With Disabilities Act (ADA):** Persons needing accommodations due to a documented disability should contact the ADA counselor for their college as soon as possible.

**Make-up policy:**

Make-up exams will not be given unless the student provides the appropriate documentation of the reason for the absence.

**Grading policy:** Your final course grade is based on the following standard HCCS scale.

Final Average	$90 \leq \text{Avg} \leq 100$	$80 \leq \text{Avg} < 90$	$70 \leq \text{Avg} < 80$	$60 \leq \text{Avg} < 70$	Avg < 60 Or Final Exam < 60
Final Course Grade	A	B	C	D	F

For students receiving dual-credit, the following grade will be posted as the high school grade equivalent: **A = 95; B = 85; C = 77; D = 72; F = 60.**

There will be five (5) in-class tests during the semester. Each test will be worth 100 points.

	Possible:		My Scores:
Test 1:	100	Test 1:	_____
Test 2:	100	Test 2:	_____
Test 3:	100	Test 3:	_____
Test 4:	100	Test 4:	_____
Test 5:	100	Test 5:	_____
Total:	500	My Total:	_____

Your Average = (Your Total) / 500

Final Average =  $0.25 * (\text{Final Exam Score}) + 0.75 * (\text{Your Average})$

**Calculators:**

Calculator use is encouraged in the study of advanced mathematics. Students should have access to a TI-83 Calculator.

**Attendance policy:**

Attendance is checked during every class.

**Tardiness policy:**

Any student who is more than 20 minutes tardy will be considered absent for the purposes of attendance.

**Withdrawal policy:**

**If you decide to drop the class, then IT IS YOUR RESPONSIBILITY TO DROP before the final drop date. If your name is on the roll at the end of the term, you WILL receive a grade.** Neither you nor your instructor will be able to perform the drop after the final drop date. Please refer to the following notice before dropping the class.

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NOTICE: Students who take a course three or more times will face significant tuition or fee increases at HCC and other Texas public colleges and universities. In addition, state law allows students a maximum of 6 course withdrawals during their entire college career. Students with more than 6 drops will be required to pay additional fees. Prior to course withdrawal, you must confer with your professor or counselor about your study habits, homework, test-taking skills, attendance, course participation, and tutoring or other assistance that is available.

### **Student conduct:**

Students should not engage in disruptive activities while in the classroom. Any conduct that is deemed detrimental to the academic atmosphere, such as cell phone use or consistently talking during instructional delivery, will not be tolerated. Any student found guilty of such conduct will be asked to leave the classroom until further notice.

### **Academic dishonesty:**

All students are required to exercise academic honesty in completion of all tests and assignments. Cheating involves deception for the purpose of violating testing rules. Students who improperly assist other students are just as guilty as students who receive assistance. A student guilty of a first offense will receive a grade of "F" on the quiz or test involved. For a second offense, the student will receive a grade of "F" for the course. The use of recording devices, including camera phones and tape recorders, is prohibited in all locations where instruction, tutoring, or testing occurs. Students with disabilities who need to use a recording device as a reasonable accommodation should contact the Disability Services Office for information.

### **Test Schedule:**

<b>Test</b>	<b>Topics Covered on Test</b>	<b>Date</b>
Test #1	Polar Coordinates; Complex Numbers; De Moivre's Theorem; Vectors	Tuesday, 2/1/10
Test #2	Systems of Equations; Rational Functions (Adding/Subtracting, Graphing); Synthetic Division; Partial Fractions	Tuesday, 2/22/11
Test #3	Inverse Functions; Exponential Functions; Logarithmic Functions	Tuesday, 3/22/11
Test #4	Conic Sections; Parametric Equations	Tuesday, 4/5/11
Test #5	Sequences and Induction; Binomial Theorem	Thursday, 4/21/11
Final Exam	Comprehensive Final Exam	Thursday, 5/12/11 (12 – 2)

**GENERAL GRADING RUBRIC:**

In free-response questions on a test, problems will be worth 3, 4 or 5 points. The rubric for grading is given below.

Meaning	Out of 3	Out of 4	Out of 5	
Superior	3	4	5	<b>Student shows understanding of the concept by:</b> <ul style="list-style-type: none"> <li>• Having fewer than 2 minor errors</li> <li>• Providing a clear, logical and complete process</li> <li>• Providing evidence of checking and/or alternate representation</li> <li>• Using creative, appropriate strategies</li> <li>• Exceeding the minimum requirements of the task</li> </ul>
Satisfactory		3	4	<b>Student shows understanding of the concept by:</b> <ul style="list-style-type: none"> <li>• Having 2 to 3 minor errors, but correct process</li> <li>• Providing a logical and complete process but lacking clarity</li> <li>• Using appropriate strategies</li> <li>• Satisfying the requirements of the task</li> </ul>
Satisfactory, With Minor Flaws	2	2	3	<b>Student shows understanding of the concept by:</b> <ul style="list-style-type: none"> <li>• Using appropriate strategies</li> <li>• Showing work, but process haphazard</li> <li>• Writing an explanation that is mainly clear, but may show some gaps</li> <li>• Satisfying some elements of the task</li> </ul>
Satisfactory, With Major Flaws	1	1	2	<b>Student shows rudimentary understanding of the concept by:</b> <ul style="list-style-type: none"> <li>• Providing haphazard, illogical, or unclear work</li> <li>• Not checking work</li> <li>• Writing an explanation that did not connect to the problem or the solution</li> <li>• Answering only (without supporting work)</li> <li>• Satisfying few elements of the task</li> </ul>
Unsatisfactory	0	0	0 – 1	<b>Student shows little or no understanding of the concept by:</b> <ul style="list-style-type: none"> <li>• Attempting the problem, but no idea</li> <li>• Not using a recognizable process</li> <li>• Calculating incorrectly</li> <li>• Using inappropriate charts and graphs</li> <li>• Satisfying no elements of the task</li> </ul>

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<b>Date</b>	<b>Day</b>	<b>Topic</b>
January 5	Wednesday	Register for Class – Introduction to Course
January 7	Friday	Polar Coordinates
January 11	Tuesday	Graph Polar Equations (Part 1)
January 13	Thursday	Graph Polar Equations (Part 2)
January 18	Tuesday	Complex Numbers; De Moivre's Theorem (Part 1)
January 20	Thursday	Complex Numbers; De Moivre's Theorem (Part 2)
January 25	Tuesday	Vectors
January 27	Thursday	The Dot Product
January 28	Friday	Review
February 1	Tuesday	<b>Test 1</b>
February 3	Thursday	Solving Systems of Equations
February 8	Tuesday	Adding and Subtracting Rational Functions
February 10	Thursday	Synthetic Division
February 11	Friday	Partial Fractions
February 15	Tuesday	Graphing Rational Functions (Part 1)
February 17	Thursday	Graphing Rational Functions (Part 2)
February 22	Tuesday	<b>Test 2</b>
February 24	Thursday	Review of Exponents/Inverse Functions
February 25	Friday	Exponential Functions
March 1	Tuesday	<b>TAKS TESTING</b>
March 3	Thursday	Logarithmic Functions (Part 1)
March 4	Friday	Logarithmic Functions (Part 2)
March 8	Tuesday	The Circle
March 10	Thursday	The Parabola
March 14 – 18	Monday – Friday	<b>Spring Break</b>
March 22	Tuesday	<b>Test 3</b>
March 24	Thursday	The Ellipse
March 25	Friday	The Hyperbola
March 29	Tuesday	Parametric Equations
March 31	Thursday	Review
April 5	Tuesday	<b>Test 4</b>
April 7	Thursday	Sequences and Summation Notation
April 8	Friday	Day in the Park
April 12	Tuesday	Arithmetic Sequences /Geometric Sequences
April 14	Thursday	Induction
April 15	Friday	The Binomial Theorem
April 19	Tuesday	Review
April 21	Thursday	<b>Test 5</b>
April 22	Friday	<b>No School – Spring Holiday</b>
April 26	Tuesday	<b>TAKS TESTING</b>
April 28	Thursday	<b>TAKS TESTING</b>
May 3	Tuesday	Introduction to Limits; Properties of Limits
May 5	Thursday	One-Sided Limits; Continuity
May 10	Tuesday	<b>Review</b>
May 12	Thursday	<b>Final Exam, 12 – 2</b>