E-mail: mohammad.afaneh@hccs.edu **(W) 713-718-2163**
Cell 713-560-2630

MyMathLab ID: afaneh01506

COURSE SYLLABUS AND POLICIES MATH 2412 - PreCalculus

Differential Calculus: A means of finding how steep a curve is at any given point.

Integral Calculus: A means of finding the area enclosed between a portion of a curve, the corresponding points on the x-axis, and two lines called "ordinates" parallel to the yaxis.

Lancelot Hogben

IMPORTANT NOTICE

"Students who repeat a course for a third time or more may soon face significant tuition/fee increases at HCC and other Texas public colleges and universities. Please ask your instructor/counselor about opportunities for tutoring or other assistance prior to considering course withdrawal or if you are not receiving passing grades."

1. **Catalog Description:** Math 2412 Pre-calculus. Credit: 4 (4 lecture). Topics include elementary theory of functions and equations, analytic geometry, vectors, introductory logic, mathematical induction, sequences and finite series.

2. **Prerequisites:** Math 1314 and Math 1316 with a passing grade of "C" or better, or consent of the Department Head.

3. **Course Intent:** This course provides the background in mathematics for sciences or further study in mathematics and its applications.

4. **Audience:** This course is a sophomore level mathematics course, which requires a background consisting of Math 1314 and Math 1316.

5. **Cheating:** Cheating can result in dismissal from the entire Houston Community College System. Any student who cheats will be dropped from the course with a grade of F. Any taking, referring to books or notes during examinations will be considered cheating.

6. **Calculators:** Calculators may be used on tests.

7. **==Homework:==** Homework is assigned in $MyMathLab$. Practice is absolutely essential to mastery of mathematics. Be prepared to ask questions about any problems you are unable to work or any material in the text you do not understand

8. **==Grading:==** **Four** Exams will be given during the semester: Each of these exams E1, E2, E3, E4 will count 20% of your final course grade. Homework assignments will count for 20% of the total grade. Therefore, your Final Course Average FCA will be calculated as follows:

$$FCA = (E1 + E2 + E3 + E4 + HW) / 5$$

Generally, the final course grade is determined by the following:

FCA	Final Grade
90-100	A
80-89	B
70-79	C
60-69	D
< 60	F

9. **==Americans with Disabilities Act (ADA)==**: The Houston Community College System Committed to providing the least restrictive learning environment for all students. HCCS promotes equity in academic access through the implementation of reasonable accommodations as required by the Vocational Rehabilitation Act of 1973, Title V, Section 504 and the Americans with disabilities Act of 1990 (ADA) which will enable students with disabilities to participate in and benefit from all post-secondary educational activities. Students needing accommodations due to a documented disability should contact the ADA counselor for their college as soon as possible.

10. **==Make-up Exams:==** **Make-up examination will not be given in this course for any reason.**

11. **==Course Objectives and Student Learning Outcomes==**:

Student Learning Outcomes	Course Objectives
1. Represent and manipulate algebraic and trigonometric functions and relations algebraically, graphically, and numerically, including partial fraction decomposition and finding zeroes of functions.	1.1 Develop and use various problem-solving techniques. 1.2 Recognize functions as ordered pairs. 1.3 Determine the graph of an algebraic equation or function. 1.4 Understand synthetic division. 1.5 Develop partial fraction decomposition. 1.6 Find the zeros of real functions 1.7 Solve polynomial equations. 1.8 Utilize the six basic trigonometric functions.
2. Engage in algebraic and trigonometric problem solving and modeling.	2.1 Apply the Law of sines and the Law of cosines for various types of situations.

3. Synthesize algebraic and trigonometric facts and laws into proofs.	3.1 Verify various trigonometric identities. 3.2 Find the powers and roots of complex numbers using DeMoivre's Theorem.
4. Analyze and manipulate equations between various two dimensional systems such as rectangular, polar, vector representations, conic systems and axes manipulations, as well as solving equations in these systems.	4.1 Understand basic vectors (2 dimensional). 4.2 Convert points in a rectangular coordinate system to polar coordinates. 4.3 Recognize algebraic formulas relating to circles, parabolas, ellipses, and hyperbolas. 4.4 Use translation of axes, rotation of axes, and polar equations of conics.

12. **Textbook:**

Precalculus, Robert Blitzer, Fifth Edition, 2006, Prentice Hall

Textbook ISBN-10: 0321837347
Textbook ISBN-13: 9780321837349

MyMathlab(Required) In this course, we will be using an online resource called MyMathLab. This resource is available on any computer that has internet access (you may have to perform a 'one time only' install of several plug-ins). If you bought a new textbook, then you should have received an envelope (labeled Student Access Kit) with instructions on how to register and a personal access code. If you bought a used book and did not receive a Student Access Kit you must purchase one separately at the bookstore or online at www.coursecompass.com. Follow the instructions in the packet to enroll in the software at www.coursecompass.com, and, when the program asks for your Course ID, type in **afaneh01506**. You'll also need to know the zip code of the college which is 77004. When you get to the main page for the course, click on the "installation wizard" menu button first to make sure you have certain plug-ins that will be needed. I encourage you to explore the site! You will quickly see that you can "do homework" assignments, "take practice tests" (these will just be practice chapter exams), check out your MyMathLab grades on "gradebook", view an online version of the book and look at multimedia resources such as on-line video clips, PowerPoint presentations, all in "multimedia library". You do not need to purchase the text book, MyMathLab has everything you need, eBook, videos, etc.

13. **Resource Materials:** Any student enrolled in Math 2413 at HCCS has access to the Academic Support Center where they may get additional help in understanding the theory or in the improving their skills. The Center is staffed with mathematics faculty and student assistants, and offers tutorial help, video tapes and computer assisted drills. Also available is a Student's Solutions Manual, which may be obtained from the Bookstore.

14. **Course Outline:** The course topics will be covered in the order listed below:

Math 2412 Pre Calculus
Topics to be covered

Unit I – Sections: {1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, and 1.10}
Topics include the following: Functions and their graphs, Linear functions and slope, Transformations of functions, Combinations and composition of functions, Inverse functions, Distance formula, Midpoint formula, Equation of a Circle, and Modeling with functions.

Unit II – Sections: {2.2, 2.3, 2.4, 2.5, 2.6, and 7.3}
Topics include the following: Quadratic functions, Polynomial functions of higher degree, Synthetic division, Real zeros of polynomial functions, Rational functions, and Partial fraction decomposition.

Unit III – Sections: {4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, and 5.1}
Topics include: Angles and radian measure, Unit circle, Right triangle trigonometry, Trigonometric functions of any angle, Graphs of the trigonometric functions, Inverse trigonometric functions, and Verifying trigonometric identities.

Unit IV – Sections: {5.2, 5.3, 5.4, 5.5, 6.1, 6.2, 6.3, 6.4, and 6.5}
Topics include: Sum and difference formulas, Double angle and half-angle formulas, Power – Reducing formulas, sum-to-product and product-to-sum formulas, Solving trigonometric equations, Law of Sines, Law of Cosines, Polar coordinates, graphs of Polar equations, and DeMoivre's Theorem.

Unit V – Sections: {6.6, 6.7, 10.1, 10.2, 10.3, 10.5, 9.1, 9.2, and 9.3}
Topics include: Vectors, Dot product, Sequences and summation notation, arithmetic sequences, Geometric Sequences and Series, The Binomial Theorem, The ellipse, The hyperbola, The parabola, Rotation of axes, Parametric equations, and Conic sections in polar coordinates.

Unit VI – Introduction to Calculus (Optional)
This unit contains an introduction to limits using tables and properties, continuity, and an introduction to derivatives.