Department of Mathematics

COURSE SYLLABUS
MATH 2412: Pre-calculus Online, Fall 2015,CRN 76702

INSTRUCTOR:	Kallarackal
CONTACT INFORMATION:	713 718 5578 Eunice.kallarackal@hccs.edu
Mymathlab course id	**Kallarackal52441**

 (The mymathlab access code is included in the book package at the bookstores. It can also be purchased separately online or at the bookstore.

Office location and hours- Learning hub 303.2, 10141 Cash Road, Stafford 77477,
 12:00pm- 1:00pm Monday-Thursday

Please feel free to contact me concerning any problems that you are experiencing in this course. You do not need to wait until you have received a poor grade before asking for my assistance. Your performance in my class is very important to me. I am available to hear your concerns and just to discuss course topics. Feel free to come by my office during these hours. Make appointment by emailing me.

1.   <mark>Catalog Description:</mark> Math 2412 Precalculus. Credit: 4 (4 lecture). Topics include elementary theory of functions and equations, analytic geometry, vectors, introductory logic, mathematical induction, sequences and finite series.

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

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

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

5.   <mark>Calculators:</mark> Calculators may be used on tests. However for the final exam Graphing calculators will not be allowed.

6.   <mark>Homework:</mark> Homework is assigned in MyMathLab. Practice is absolutely
      essential to mastery of mathematics. Go to mymathlab.com to do homework .
Homework is 20% of your grade

7.   <mark>Grading:</mark> **Six e**xams including the final will be given during the semester: **Final Exam has to be taken at the testing center at 3100Main. Houston TX 77002. If you are taking the class from out of town you have to arrange for a proctor through the distance education department. Please make sure that you do that at least three weeks prior to the final exam date. Final exam is 30% of your grade**

Course average = HW(20%)+ Average of four tests (50%)+ Final(30%)

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

8. **Americans with Disabilities Act (ADA)**: The Houston Community College System is 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 who require reasonable accommodations for disabilities are encouraged to report to Dr. Becky Hauri at 713-718-7910 to make necessary arrangements. Faculty is only authorized to provide accommodations by the Disability Support Service Office.

9. **Make-up Exams:** Generally make-up examination will not be given in this course. But I will drop the lowest test grade out of the 5 tests . If you miss a test, grade for that test will be 0 and that grade will be dropped. Make sure you do not miss more than one test.
No review will be given for the tests that are taken from home. Homework prepares you for the test. But I will give a review for the final which has to be taken on campus.

10. **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	3.1 Verify various trigonometric identities. 3.2 Find the powers and roots of complex

facts and laws into proofs.	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.

11. Textbook:

Precalculus, Robert Blitzer, Fifth Edition, 2014, Prentice Hall

ISBN-1323246916
(use the above ISBN for reduced rate)

Mathlab(Required) In this course, we will be using an online resource called MyMathLab. All homework and exams are done online. You need an access code to register to do the homework. If you bought a new textbook, then you should have received 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 http://pearsonmylab.com. You also need a course ID to register. It is kallarackal52441. You also need to know the zip code of the college which is 77477. 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. You have the option to try this online program for free for about two weeks. So register to do the homework the first day of class itself.

Homeworks have due dates. Once the homework for a section is closed, it is closed. Check mymathlab for the due dates.

Exam will open at 12:00am on the date of the exam and will close at 11:59pm that day.

12.   Resource Materials: Any student enrolled in Math 2412 at HCCS has access to the online tutoring .go to askonline.net and get help.   Also available is a Student's Solutions Manual, which may be obtained from the Bookstore.

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

Math 2412 PreCalculus

Topics to be covered

APPROXIMATE TIME	TEXT REFERENCE
Unit I – Review, Factoring with negative rational exponents	**Sections:1.2,1.3,1.4,2.3.2.4.2.5**
Factoring with negative rational exponents	**Section:** Addendum 1
Partial Fractions	**Section:** 7.3
Review Topics include the following: Graphs and graphing utilities, lines in the plane, slope, functions, polynomial functions of higher degree, synthetic division, real zeros of polynomial functions, and the intermediate value theorem.	

Required topics are: Factoring with negative rational exponents, finding the difference quotient, and partial fraction decomposition.

Unit II – Trigonometry (review)	**Sections:** {4.2, 4.5 - 4.7}
Analytic Trigonometry (review)	**Sections:** {5.1 – 5.3}
Analytic Trigonometry	**Sections:** 5.4, 5.5

This unit contains Trigonometric Functions, the unit circle, graphs of the trigonometric functions, inverse trigonometric functions, verifying identities, sum and difference formulas, double angle and half-angle formulas, sum-to-product and product-to-sum formulas, and solving trigonometric equations.

Unit III – Applications of Trigonometry   **Sections:**   Chapter 6

This unit includes Law of Sines, Law of Cosines, Polar coordinates, graphs of Polar equations, DeMoivre's Theorem, vectors, and the dot product.

Unit IV – Conic Sections and Analytic Geometry   **Sections:**   Chapter 9

Topics include the ellipse, the hyperbola, the parabola, rotation of axes, parametric equations, and conic sections in polar coordinates.

Unit V – Sequences, Induction, and Probability   **Sections:**   10.1 – 10.5

This unit contains Sequences and summation notation, arithmetic sequences, Geometric Sequences and Series, Mathematical Induction, and The Binomial Theorem.

Unit VI – Introduction to Calculus   **Sections:**   11.1 – 11.4

This unit contains an introduction to limits using tables and properties, continuity, and an introduction to derivatives.

Textbook: *Precalculus,* Robert Blitzer, 5e, 2013, Pearson Prentice Hall
Tentative Exam dates:
Exam1 9/04/2015
Exam2 9/25/2015
Exam3 10/16/2015
Exam4 11/06/2015
Exam5 12/1/2015
Final Exam as per calendar

14. Academic Honesty

A student who is academically dishonest is, by definition, not showing that the coursework has been learned, and that student is claiming an advantage not available to other students. The instructor is responsible for measuring each student's individual achievements and also for ensuring that all students compete on a level playing field. Thus, in our system, the instructor has teaching, grading, and enforcement roles. You are expected to be familiar with HCC's policy on Academic Honesty, found in the catalog. What that means is: If you are charged with an offense, pleading ignorance of the rules will not help you. Students are responsible for conducting themselves with honor and integrity in fulfilling course requirements. Penalties and/or disciplinary proceedings may be initiated by College System officials against a student accused of scholastic dishonesty. "Scholastic dishonesty": includes, but is not limited to, cheating on a test, plagiarism, and collusion.
Cheating on a test includes:
- Copying from another students' test paper;
- Using materials not authorized by the person giving the test;
- Collaborating with another student during a test without authorization;

- Knowingly using, buying, selling, stealing, transporting, or soliciting in whole or part the contents of a test that has not been administered;
- Bribing another person to obtain a test that is to be administered.
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15. HCC Course Withdrawal Policy

If you feel that you cannot complete this course, you will need to withdraw from the course prior to the final date of withdrawal. Before, you withdraw from your course; please take the time to meet with the instructor to discuss why you feel it is necessary to do so. The instructor may be able to provide you with suggestions that would enable you to complete the course. Your success is very important. Beginning in fall 2007, the Texas Legislature passed a law limiting first time entering freshmen to no more than **SIX** total course withdrawals **throughout** their educational career in obtaining a certificate and/or degree.

To help students avoid having to drop/withdraw from any class, HCC has instituted an Early Alert process by which your professor *may* "alert" you and HCC counselors that you might fail a class because of excessive absences and/or poor academic performance. It is your responsibility to visit with your professor or a counselor to learn about what, if any, HCC interventions might be available to assist you – online tutoring, child care, financial aid, job placement, etc. – to stay in class and improve your academic performance.

If your name is on the roll at the end of the term, you WILL receive a grade. If you wish to drop the class, then it is your responsibility to do that before the final drop date.Check HCC calendar for the last day of withdrawal. Neither you nor your instructor will be able to perform the drop after that date. In the past, you had to request to be dropped by an instructor or counselor, but now you have the ability to drop yourself online by logging into your HCC student center:
https://hccsaweb.hccs.edu:8080/psp/csprd/?cmd=login&languageCd=ENG

The Distance Education Student Handbook contains policies and procedures unique to the DE student. It is the student's responsibility to be familiar with the handbook's contents and part of the mandatory orientation. The handbook contains valuable information, answers, and resources, such as DE contacts, policies and procedures (how to drop, attendance requirements, etc.), student services (ADA, financial aid, degree planning, etc.), course information, testing procedures, technical support, and academic calendars. Refer to the DE Student Handbook by visiting this link: http://de.hccs.edu/media/houston-community-college/distance-education/student-services/DE-Student-Handbook.pdf

As your Instructor, it is my responsibility to**:**
- Provide the grading scale and detailed grading formula explaining how student grades are to be derived
- Facilitate an effective learning environment through class activities, discussions, and lectures
- Description of any special projects or assignments
- Inform students of policies such as attendance, withdrawal, tardiness and make up
- Provide the course outline and class calendar which will include a description of any special projects or assignments
- Arrange to meet with individual students

To be successful in this class, it is the student's responsibility to**:**
- Attend class and participate in class discussions and activities
- Read and comprehend the textbook
- Complete the required assignments and exams:
- Chapter Exams, mymathlab Homework, Final Exam
- Ask for help when there is a question or problem

Keep copies of all paperwork, including this syllabus, handouts and all assignments

EGLS₃ -- Evaluation for Greater Learning Student Survey System

At Houston Community College, professors believe that thoughtful student feedback is necessary to improve teaching and learning. During a designated time, you will be asked to answer a short online survey

Addendum 1

Factoring with negative rational exponents

p. 67 Example 13

Exercises:
p. 69 #93 – 101

Suggested supplementary problems

1. Factor: $2(2x+3)(4x+1)^{-\frac{1}{2}} + 2(4x+1)^{\frac{1}{2}}$

2. Factor: $(3x+4)^{\frac{1}{2}} + \dfrac{3}{2}(x+5)(3x+4)^{-\frac{1}{2}}$

3. Factor: $4(x+5)^{-\frac{3}{2}} - \dfrac{3}{2}(4x+7)(x+5)^{-\frac{5}{2}}$

4. Factor: $3(5x-3)(2x-1)^{-\frac{1}{2}} + 6(5x-3)^{2}(2x-1)^{\frac{1}{2}}$

5. Factor: $8(7x-3)^{\frac{1}{2}}(2x+5)^{-\frac{1}{3}} + 4(7x-3)^{\frac{3}{2}}(2x+5)^{\frac{2}{3}}$

Addendum 2

Difference Quotient

The **difference quotient** is basically the slope formula but used with nonlinear functions. Since a nonlinear function does not have a slope in the traditional sense, we cannot refer to this as the slope of the curve. The formula for the difference quotient is:

$$\frac{f(x+h)-f(x)}{h}$$

Example 1
Let $f(x) = x^2 + 4$, find the difference quotient.

Solution:

$$f(x+h) = (x+h)^2 + 4$$

$$= x^2 + 2xh + h^2 + 4 \qquad \text{\color{red}remember to square the binomial}$$

$$f(x+h) - f(x) = x^2 + 2xh + h^2 + 4 - (x^2 + 4)$$

$$= x^2 + 2xh + h^2 + 4 - x^2 - 4 \qquad \text{\color{red}be careful when subtracting}$$

$$= 2xh + h^2$$

$$\frac{f(x+h)-f(x)}{h} = \frac{2xh + h^2}{h}$$

$$= \frac{h(2x+h)}{h}$$

$$= 2x + h$$

Exercises
Find the difference quotient for each function.

1. $f(x) = x^2 - 1$

2. $f(x) = x^2 + 3x + 4$

3. $g(x) = x^3$

4. $f(x) = x^3 - 3x^2$

5. $g(x) = 2x^3 - 4x + 8$

Administration contact information

College - Level Math Courses

Chair of Math	Jaime Hernandez	SW Campu	713-718-7772	Stafford, Scarcella, N108
- Secretary		SW Campu	713-718-7770	Stafford, Scarcella, N108

Math Assoc. Chair	Roderick McBane	CE Campu	713-718-6644	San Jacinto Building, Rm 369
Math Assoc. Chair	Ernest Lowery	NW Campu	713-718-5512	Katy Campus Building, Rm 11
Math Assoc. Chair	Mahmoud Bashara	NE Campu	713-718-2438	Codwell Hall Rm 105

Developmental Math Courses

Chair of Dev. Math	Susan Fife	SE Campu	713-718-7241	Felix Morales Building, Rm 12
- Secretary	Carmen Vasquez	SE Campu	713-718-7056	Felix Morales Building, Rm 12
Dev. Math Assoc. Cha	Marisol Montemay	SE Campu	713-718-7153	Felix Morales Building, Rm 12
Dev. Math Assoc. Cha	Jack Hatton	NE Campu	713-718-2434	Northline Building, Room 321

For issues related to your class, please first contact your instructor.
If you need to contact departmental administration, then contact the appropriate Associate Chair.
If further administrative contact is necessary, then contact the appropriate Department Chair.