DEPARTMENT OF MATHEMATICS
SOUTHWEST COLLEGE

COURSE SYLLABUS – SUMMER 2016
MATH 2412: PreCalculus

CRN 15380 / Mo - Fr 10:00 – 12:30 PM / West Loop Center, Room C257

INSTRUCTOR:	Houssam Kalajo
CONTACT INFORMATION:	Houssam.kalajo@hccs.edu web page http://learning.hccs.edu/faculty/houssam.kalajo
MYMATHLAB COURSE ID:	**Kalajo61545** **All homework assignments Due on or before 07/07/2016**

Office location and hours: West Loop Campus, Student Success Center F15, 7 – 8 am, Mo-Fr and by appointment.

Course Description
Math 2412: Precalculus. Topics include elementary theory of functions and equations, analytic geometry, vectors, introductory logic, mathematical induction, sequences and finite series.

Prerequisites
Math 1314: Pass with a "C" or better AND Math 1316: Pass with a "C" or better or Departmental approval

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

Course Student Learning Outcomes (SLO):
1. Represent and manipulate algebraic and trigonometric functions and relations algebraically, graphically, and numerically, including partial fraction decomposition and finding zeroes of functions.
2. Engage in algebraic and trigonometric problem solving and modeling.
3. Synthesize algebraic and trigonometric facts and laws into proofs.
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.
5. Investigate and perform summations and predictions on geometric, algebraic and binomial sequences and series.

Learning outcomes
Students will:
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.
2.1 Apply the Law of sines and the Law of cosines for various types of situations.
3.1 Verify various trigonometric identities.
3.2 Find the powers and roots of complex numbers using DeMoivre's Theorem.
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.
5.1 Recognize the use of arithmetic and geometric sequences.

5.2 Use summation notation to represent a series.
5.3 Understand and use the Binomial theorem.
5.4 Understand mathematical induction.
5.5 Understand the basic concepts of limits.

Core Objectives
Given the rapid evolution of necessary knowledge and skills and the need to take into account global, national, state, and local cultures, the core curriculum must ensure that students will develop the essential knowledge and skills they need to be successful in college, in a career, in their communities, and in life. Through the Texas Core Curriculum, students will gain a foundation of knowledge of human cultures and the physical and natural world, develop principles of personal and social responsibility for living in a diverse world, and advance intellectual and practical skills that are essential for all learning.

Students enrolled in this core curriculum course will complete a research project or case study designed to cultivate the following core objectives:

Critical Thinking Skills: to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information.

Communication Skills: to include effective development, interpretation and expression of ideas through written, oral and visual communication.

Empirical and Quantitative Skills: to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions.

Instructional Materials

Textbook:
Precalculus 5/E

- Blitzer, Robert
- Textbook ISBN-10: 0321837347
- Textbook ISBN-13: 9780321837349
- Publisher: Pearson Math & Statistics

Students will either need to purchase their textbook/access code bundle from the bookstore, OR they can purchase online via the MML registration process. MyMathLab ALWAYS comes with an e-Text.

MATH 2412 – PRECALCULUS
LECTURE SCHEDULE

APPROXIMATE TIME	TEXT REFERENCE
Unit I – Factoring with negative rational exponents	**Section:** Addendum 1
Difference Quotient	**Section:** Addendum 2
Partial Fractions	**Section:** 7.3
(3 hours)	
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
{7 hours}	
(4 hours)	

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 (12 hours) **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 (15 hours) **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 (14 hours) **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 (10 hours) **Sections:** 11.1 – 11.4

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

Review for Final Examination: Cover all previous sections 4 hours
Comprehensive Final Examination: Covers all previous sections 2 hours

Instructional Methods
As an instructor, I want my students to be successful. I feel that it is my responsibility to provide you with knowledge concerning mathematical concepts contained in our developmental math curriculum. This knowledge will prepare you for College Algebra and will allow you to meet the math requirements that are needed for your career of choice.
As a student wanting to master the mathematical concepts contained in the developmental math curriculum, it is your responsibility to read the textbook, submit assignments on the due dates, study for the exams, participate in classroom activities, attend class, and enjoy the learning experience. In this course, you will be involved in discussions with your classmates and your instructor. As you will want to contribute to these discussions, you will need to come to class prepared to discuss, analyze and evaluate information from your text and notes.

Student Assignments
Assignments have been developed that will enhance your learning. To better understand a topic, you will be given assignments on key information that you will need to remember for your success in your career. Students will be required to successfully complete the following:

Mathematics Homework Assignments
All homework assignments for this class must be completed online using MYMATHLAB. The MyMathLab Course ID to be used for registration purposes only and the school zip code is 77477 or 77081. To register for MyMathLab and to access the homework, go to www.coursecompass.com.

Note:

- No extra work is given for extra credit.
- No extra work is given to "bring up my grade".
- Be sure that your name in MyMathLab exactly matches your name on Class Roster.

Calculator Policy: A graphing or a scientific calculator may be used in this course for class work and also on all exams**.** Cell phones may not be used as calculators.

Exam Policy: There will be three or four major examinations plus the final exam**.** Each exam is worth 100 points. Before each exam, please clear your desk of all material except pencils/pens, erasers, calculator, and scratch work. In addition, please do not share any material during an exam.

Make-up Policy
Tests must be taken on the specified day. *No MAKE-UP* examinations will be given. The final examination grade will be substituted for one missed test only, regardless of reason. If a second test is missed, the score for that test is zero; thus, more weight will be given to the final examination than would be the case if all examinations were taken on time.

Final Examination:
The final exam is comprehensive, and questions on it can deal with any of the course objectives. The final examination must be taken by all students.

HCC Policy Statement - ADA
Services to Students with Disabilities
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

HCC Policy Statement: Title IX
HCC is committed to provide a learning and working environment that is free from discrimination on the basis of sex which includes all forms of sexual misconduct. Title IX of the Education Amendments of 1972 requires that when a complaint is filed, a prompt and thorough investigation is initiated. Complaints may be filed with the HCC Title IX Coordinator available at 713 718-8271 or email at oie@hccs.edu.

Title IX of the Education Amendments of 1972 requires that institutions have policies and procedures that protect students' rights with regard to sex/gender discrimination.
Information regarding these rights are on the HCC website under Students-Anti-Discrimination. Students who are pregnant and require accommodations should contact any of the ADA Counselors for assistance.
It is important that every student understands and conforms to respectful behavior while at HCC. Sexual misconduct is not condoned and will be addressed promptly. Know your rights and how to avoid these difficult situations.

Log in to www.eduriskssolutions.org. Sign in using your HCC student email account, then go to the button at the top right that says Login and enter your student number.

HCC Policy Statement: 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 the University'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.

Plagiarism means the appropriation of another's work and the unacknowledged incorporation of that work in one's own written work offered for credit.

Collusion mean the unauthorized collaboration with another person in preparing written work offered for credit.
Possible punishments for academic dishonesty may include a grade of 0 or F in the particular assignment, failure in the course, and/or recommendation for probation or dismissal from the College System. (See the Student Handbook)

HCC Policy Statements

Class Attendance - It is important that you come to class! Attending class regularly is the best way to succeed in this class. Research has shown that the single most important factor in student success is attendance. Simply put, going to class greatly increases your ability to succeed. You are expected to attend all lecture and labs regularly. You are responsible for materials covered during your absences. Class attendance is checked daily. Although it is your responsibility to drop a course for nonattendance, the instructor has the authority to drop you for excessive absences.

If you are not attending class, you are not learning the information. As the information that is discussed in class is important for your career, students may be dropped from a course after accumulating absences in excess of six (6) hours of instruction. The six hours of class time would include any total classes missed or for excessive tardiness or leaving class early.

You may decide NOT to come to class for whatever reason. As an adult making the decision not to attend, you do not have to notify the instructor prior to missing a class. However, if this happens too many times, you may suddenly find that you have "lost" the class.
Poor attendance records tend to correlate with poor grades. If you miss any class, including the first week, you are responsible for all material missed. It is a good idea to find a friend or a buddy in class who would be willing to share class notes or discussion or be able to hand in paper if you unavoidably miss a class. Class attendance equals class success.

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 you plan on withdrawing from your class, you **MUST** contact a HCC counselor or your professor prior to withdrawing (dropping) the class for approval and this must be done **PRIOR** to the withdrawal deadline to receive a "W" on your transcript. **Final withdrawal deadlines vary each semester and/or depending on class length, please visit the online registration calendars, HCC schedule of classes and catalog, any HCC Registration Office, or any HCC counselor to determine class withdrawal deadlines. ***Remember to allow a 24-hour response time when communicating via email and/or telephone with a professor and/or counselor. Do not submit a request to discuss withdrawal options less than a day before the deadline.*** If you do not withdraw before the deadline, you will receive the grade that you are making in the class as your final grade. If you wish to drop the class, then it is your responsibility to do that before the final drop date. ***Neither you nor your instructor will be able to perform the drop after the final drop date and I will not drop you for nonattendance.***

ATTENDANCE POLICY: Attendance is compulsory. Attendance is checked during every class. When you have accumulated 12.5 % or 6 hours of absences, the instructor is obligated by law to drop you from the class. It is your responsibility to be sure that you are marked present before leaving the class. Students are expected to attend class regularly and they are responsible for materials covered during their absences. Student can contact his/her friend or myself if available, regarding it. The nature of the course is such that perfect attendance is essential for mastery of the course content. A missed class can never be duplicated.

INSTRUCTIONS POLICY: All instructions given in class must be followed strictly. No excuse shall be accepted if you do not follow or miss instructions. It is your responsibility to clarify the doubts immediately.

Repeat Course Fee

The State of Texas encourages students to complete college without having to repeat failed classes. To increase student success, students who repeat the same course more than twice, are required to pay extra tuition. The purpose of this extra tuition fee is to encourage students to pass their courses and to graduate. Effective fall 2006, HCC will charge a higher tuition rate to students registering the third or subsequent time for a course. If you are

considering course withdrawal because you are not earning passing grades, confer with your instructor/counselor as early as possible about your study habits, reading and writing homework, test taking skills, attendance, course participation, and opportunities for tutoring or other assistance that might be available.

Classroom Behavior

As your instructor and as a student in this class, it is our shared responsibility to develop and maintain a positive learning environment for everyone. Your instructor takes this responsibility very seriously and will inform members of the class if their behavior makes it difficult for him/her to carry out this task. As a fellow learner, you are asked to respect the learning needs of your classmates and assist your instructor achieve this critical goal.

Use of Camera and/or Recording Devices

As a student active in the learning community of this course, it is your responsibility to be respectful of the learning atmosphere in your classroom. To show respect of your fellow students and instructor, you will turn off your phone and other electronic devices, and will not use these devices in the classroom unless you receive permission from the instructor.

Use of recording devices, including camera phones and tape recorders, is prohibited in classrooms, laboratories, faculty offices, and other locations where instruction, tutoring, or testing occurs. Students with disabilities who need to use a recording device as a reasonable accommodation should contact the Office for Students with Disabilities for information regarding reasonable accommodations

Instructor Requirements

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 before and after class as required

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

Grading policy

Your instructor will conduct exams, and monitor your progress on homework assignments to determine how successful you are at achieving the course learning outcomes (mastery of course content and skills) outlined in the syllabus. If you find you are not mastering the material and skills, you are encouraged to reflect on how you study and prepare for each class. Your instructor welcomes a dialogue on what you discover and may be able to assist you in finding resources on campus that will improve your performance.

Your course grade will be computed as follows:

3 exams	45% (each 15%)
Homework	20%
Final exam	35%

One lowest major exam out of 4 will be dropped.

Final Average Score = Average of 3 exams * 0.45 + HWK (MyMathLab) * 0.20 + Final Exam * 0.35

Your final course grade is based on the following standard HCC scale.

Final Average	90 ≤ Avg ≤ 100	80 ≤ Avg < 90	70 ≤ Avg < 80	60 ≤ Avg < 70	Avg < 60
Final Course Grade	A	B	C	D	F

FINAL GRADE OF FX Students who stop attending class and do not withdraw themselves prior to the withdrawal deadline may either be dropped by their professor for excessive absences or be assigned the final grade of "FX" at the end of the semester. Students who stop attending classes will receive a grade of "FX", compared to an earned grade of "F" which is due to poor performance. Logging into a DE course without active participation is seen as non-attending.

Please note that HCC will not disperse financial aid funding for students who have never attended class. Students who receive financial aid but fail to attend class will be reported to the Department of Education and may have to pay back their aid. A grade of "FX" is treated exactly the same as a grade of "F" in terms of GPA, probation, suspension, and satisfactory academic progress.

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 of research-based questions related to instruction. The anonymous results of the survey will be made available to your professors and division chairs for continual improvement of instruction. Look for the survey as part of the Houston Community College Student System online near the end of the term. Visit www.hccs.edu/EGLS3 for more information.

Administration contact information

College - Level Math Courses

Chair of Math	Jaime Hernandez	SW Campus	713-718-2477	Stafford, Scarcella, N108
-Secretary	Tiffany Pham	SW Campus	713-718-7770	Stafford, Scarcella, N108
Math Assoc. Chair	Roderick McBane	CE Campus	713-718-6644	San Jacinto Building, Rm 369
Math Assoc. Chair	Ernest Lowery	NW Campus	713-718-5512	Katy Campus Building, Rm 112
Math Assoc. Chair	Mahmoud Basharat	NE Campus	713-718-2438	Codwell Hall Rm 105

Developmental Math Courses

Chair of Dev. Math	Susan Fife	SE Campus	713-718-7241	Felix Morales Building, Rm 124
- Secretary	Carmen Vasquez	SE Campus	713-718-7056	Felix Morales Building, Rm 124
Dev. Math Assoc. Chair	Marisol Montemayor	SE Campus	713-718-7153	Felix Morales Building, Rm 124
Dev. Math Assoc. Chair	Jack Hatton	NE Campus	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.

Resources:

1. Any student enrolled in Math at HCCS has access to the Learning Support Center (LRC) 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. A student's Solutions manual may be obtained from the bookstore. Check any HCC campuses for the math tutoring schedule.

2. **Ask Online Tutoring:** Students can get ***free*** assistance, 24 hours a day, 7 days a week, in Mathematics, English and many other subjects, at www.hccs.askonline.net. Typically, posted questions will be answered by an HCC tutor or faculty member within 24 hours.

3. By purchasing a MyMathLab access code, students can also receive free tutoring from the Pearson Tutor Center at http://digitalvellum.next.ecollege.com/postindexmixed.html?courseId=5734065 . Students can get tutoring either over the phone, fax, email, or interactive web.

4. There are also several online math resources that you can find with an internet search like the following links:
   - http://khanacademy.org
   - http://sophia.hccs.edu/~douglas.bump/math
   - http://www.purplemath.com/
   - http://www.awl.com/tutorcenter/stinfo.html
   - http://www.harcourtcollege.com/math/nettutor/0030260264/
   - http://www.mhhe.com/barnett

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

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

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:

$$\begin{aligned} f(x+h) &= (x+h)^2+4 \\ &= x^2+2xh+h^2+4 \qquad \text{remember to square the binomial} \\ f(x+h)-f(x) &= x^2+2xh+h^2+4-(x^2+4) \\ &= x^2+2xh+h^2+4-x^2-4 \qquad \text{be careful when subtracting} \\ &= 2xh+h^2 \\ \frac{f(x+h)-f(x)}{h} &= \frac{2xh+h^2}{h} \\ &= \frac{h(2x+h)}{h} \\ &= 2x+h \end{aligned}$$

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

Pearson's MyLab & Mastering
Student Registration Instructions

MyMathLab®

PEARSON ALWAYS LEARNING

To register for Math 2412 Summer 2016 / Mo - Fr 10:00 - 12:30 pm / CRN 15380:

1. Go to www.pearsonmylabandmastering.com.
2. Under Register, select **Student**.
3. Confirm you have the information needed, then select **OK! Register now**.
4. Enter your instructor's course ID: kalajo61545, and **Continue**.
5. Enter your existing Pearson account **username** and **password** to **Sign In**.

   You have an account if you have used a Pearson product, for example: MyMathLab, MyITLab, MyPsychLab, MySpanishLab or Mastering, such as MasteringBiology.

   ➢ If you don't have an account, select **Create** and complete the required fields.
6. Select an access option.

   ➢ Use the access code that came with your textbook or that you purchased separately from the bookstore.
   ➢ Buy access using a credit card or PayPal account.
   ➢ If available, get 14 days temporary access. (The link is near the bottom of the screen.)
7. From the confirmation page, select **Go To My Courses**.
8. On the My Courses page, select the course tile **Math 2412 Summer 2016 / Mo - Fr 10:00 - 12:30 pm / CRN 15380** to start your work.

To sign in later:

1. Go to www.pearsonmylabandmastering.com.
2. Select **Sign In**.
3. Enter your Pearson account **username** and **password,** and **Sign In**.
4. Select the course tile **Math 2412 Summer 2016 / Mo - Fr 10:00 - 12:30 pm / CRN 15380** to start your work.

To upgrade temporary access to full access:

1. Go to www.pearsonmylabandmastering.com.
2. Select **Sign In**.
3. Enter your Pearson account **username** and **password,** and **Sign In**.
4. Select **Upgrade access** from the course tile **Math 2412 Summer 2016 / Mo - Fr 10:00 - 12:30 pm / CRN 15380**.
5. Enter an access code or purchase access with a credit card or PayPal account.

For a registration overview, go to www.pearsonmylabandmastering.com/students/get-registered. Scroll down to **Need a little help?** and select a video.