



Mathematics Southwest

Math 0409: Foundations of Mathematics

CRN 16279– Spring 2017

West Loop Center Room C255

Meeting Days and Times: TuTh, 8:00 AM – 10:30 PM

4 hour lecture course / 64 hours per semester/ 16 weeks

Textbook: Introductory and Intermediate Algebra. Houston Community College Developmental Math Courses 0409/0312 (Custom Edition). Pearson Learning Solutions: Boston, 2015

ISBN 13: 978-1-323-15682-7.

MyMathLab Course ID: **osman84466**

Instructor:	Osman M. Osman
Instructor Contact Information:	osman.osman@hccs.edu
Office location and hours:	By appointment only

Course Description

Foundations of Mathematics: Topics include real numbers, basic geometry, polynomials, factoring, linear equations, linear inequalities, set operations, rational expressions, and an introduction to modeling which may include exponential, quadratic and linear models. A departmental final examination must be passed with a score of 60% or more in order to pass the course. Prerequisite: MATH 0106 or equivalent test score.

Prerequisites

MATH 0106 with “C” or better or equivalent test score.

Course Goal:

This course is intended for students who have either never been exposed to algebra or who have been away from the subject for quite some time. Particularly, this course is intended to prepare students for the study of Math 0312 or for a non–Algebra–based College Level Math course, specifically Math 1332.

Course Student Learning Outcomes (SLO):

1. Identify and apply properties of real numbers, and perform accurate arithmetic operations with numbers in various formats.
2. Demonstrate the ability to manipulate/simplify algebraic expressions, & classify/solve algebraic equations with appropriate techniques.
3. Demonstrate the use of elementary graphing techniques.
4. Apply basic geometric theorems and formulas to rectangles, squares, parallelograms, triangles, parallelograms, triangles and circles.
5. Apply “Proportional Reasoning” to solve related problems including ratios, rates, proportion, percent and conversions of units.
6. Recognize, examine, and interpret the linear, quadratic, exponential, and/or rational models of equations.

Learning objectives

Students will:

1. Add, subtract, multiply and divide real numbers and manipulate certain expressions.
2. Find the perimeter and area of rectangles, squares, parallelograms, triangles and circles.
3. Solve problems using scientific notation.
4. Simplify algebraic expressions.
5. Solve problems using equations and inequalities.
6. Factor polynomials using the techniques of the greatest common factor, grouping, difference of two squares and trinomials of the form $x^2 + bx + c$.
7. Multiply and divide, and simplify rational expressions
8. Plot ordered pairs and graph linear equations.
9. Graph linear inequalities.
10. Find the rate of change of a line & write its equation.
11. Model situations with linear, quadratic, or exponential functions

Course Outline:

GEOMETRY and SET OPERATIONS (Unit I) (6 hours)

This unit presents the basic geometric figures, their relations, and basic set operations. The instructor should emphasize the perimeter and area of triangles, quadrilaterals, and circles and set operations including union and intersection. Listed below are the subtopics covered in this unit:

SECTION NUMBERS	Approximate Time TOPICS
8.2 Perimeter	757
8.3 Area	762
8.4 Circles	773
D Sets	746

INTRO. TO REAL NUMBERS & ALGEBRAIC EXPRESSIONS (Unit II) (8 hours)

This unit presents an introduction to algebra and the real number system. The instructor should emphasize addition, subtraction, multiplication and division of real numbers and the properties of real numbers. This unit concludes with simplifying expressions and the order of operations. Listed below are the subtopics covered in this unit:

SECTION NUMBERS	Approximate Time TOPICS
1.1 Introduction to Algebra	44
1.2 The Real Numbers	51
1.3 Addition of Real Numbers	62
1.4 Subtraction of Real Numbers	70
1.5 Multiplication of Real Numbers	79
1.6 Division of Real Numbers	86
1.7 Properties of Real Numbers	95
1.8 Simplifying Expressions; Order of Operations	108

RECOMMEND EXAMINATION I: COVERS Units I & II (1 to 1.5 hours)

SOLVING EQUATIONS AND INEQUALITIES (Unit III) (8 hours)

The major emphasis of this chapter is to teach solving linear equations. A mastery of this chapter requires that the student have a thorough understanding of combining like terms and properties of equality. The skills necessary for solving equations is extended to and include working with the equality of two fractions and solving inequalities in a single variable. Listed below are the subtopics covered in this unit:

SECTION NUMBERS	Approximate Time TOPICS
2.1 Solving Equations: The Addition Principle	126
2.2 Solving Equations: The Multiplication Principle	132
2.3 Using the Principles Together	138
2.4 Formulas	149

2.5	Applications of Percent	159
2.6	Applications and Problem Solving	167
2.7	Solving Inequalities	184
2.8	Applications and Problem Solving with Inequalities	196

GRAPHS OF LINEAR EQUATIONS AND INEQUALITIES (Unit IV) (6 hours)

This unit introduces plotting ordered pairs, rates of change (slopes), and sketching linear equations of the form $y = mx + b$ and linear inequalities. Listed below are the subtopics covered in this unit:

SECTION NUMBERS	Approximate Time TOPICS
3.1	Graphs and Application of Linear Equations 214
3.2	More with Graphing and Intercepts 231
3.3	Slope and Applications 242
3.5	Graphing Using the Slope and the y-Intercept 242
3.7	Graph Linear Inequalities in Two Variables 242

POLYNOMIALS: OPERATIONS (Unit V) (12 hours)

This unit begins with integer exponents and scientific notation. The topics include the techniques to recognize a polynomial and find the degree of a polynomial; perform addition, subtraction, multiplication and division of polynomials. Listed below are the subtopics covered in this unit:

SECTION NUMBERS	Approximate Time TOPICS
4.1	Integers as Exponents 294
4.2	Exponents and Scientific Notation 304
4.3	Introduction to Polynomials 316
4.4	Addition and Subtraction of Polynomials 329
4.5	Multiplication of Polynomials 339
4.6	Special Products 346
4.7	Operations with Polynomials in Several Variables 357
4.8	Division of Polynomials (Monomials Divisors Only) 366

RECOMMEND EXAMINATION 2: COVERS UNITS III, IV, & V (1.5 HOURS)

POLYNOMIALS: FACTORING (Unit VI) (6 hours)

This unit covers factorization of polynomials. Factoring trinomials is limited to trinomials of the form $x^2 + bx + c$ or trinomial squares. Listed below are the subtopics covered in this unit:

SECTION NUMBERS	Approximate Time TOPICS
5.1	Introduction to Factoring 384
5.2	Factoring Trinomials of the Type $x^2 + bx + c$ 392
5.5	Factoring Trinomial Squares and Differences of Squares 418

5.6	Factoring : A General Strategy (Omit $ax^2 + bx + c$, except trinomial squares)	428
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RATIONAL EXPRESSIONS AND EQUATIONS (Unit VII) (4 hours)

This unit begins with multiplying and simplifying rational expressions. The topics include techniques to reduce or build-up fractions, addition, subtraction, multiplication and division of fractions. Listed below are the subtopics covered in this unit:

SECTION NUMBERS	Approximate Time TOPICS
6.1	Multiplication and Simplifying Rational Expressions.....466
6.2	Division and Reciprocals476
6.7	Rational Equations and applications (Proportions only).....509

RADICAL EXPRESSIONS AND EQUATIONS (Unit IX) (2 hours)

This unit covers finding the principal square roots, identifying radicands of radical expressions, identifying whether a radical expression represents a real number and simplifying radical expressions with a perfect-square radicand. Listed below is the subtopic covered in this unit:

SECTION NUMBERS	Approximate Time TOPICS
From the Intermediate Algebra portion of the book:	
7.1	Radical Expressions (Perfect Squares Only).....434

LINEAR, QUADRATIC, AND EXPONENTIAL MODELING (Unit IX) (4 hours)

This unit covers includes matching scatter plots with tables of values and simple equations, knowing that a linear equation has a straight line, quadratic is U-shaped, and exponential either increases or decreases without bound in one direction and levels out in the other direction (without mentioning the term "asymptote.") Listed below are the subtopics covered in this unit: The material for Unit IX can be found in the Eagle Online Model Course and in the MyMathLab Model Course.

- Linear modeling**
- Quadratic modeling**
- Exponential modeling**

RECOMMEND EXAMINATION 3: Units VI, VII, VIII, & IX (1.5 HOURS)

Instructional Methods

As an instructor, my goal is the success of my students. In each session, I open with a brief reminder of the previous session material. I encourage students a profound understanding of mathematical concepts by training them to use logical reasoning instead of memorizing formulas, and I encourage students to be involved in classroom. I usually ask questions during the session to get a feedback. I also encourage students to do a lot of homework, because mathematics is one of subjects that you learn by practicing it. Most of the instruction will come from a homework management system called MyMathLab, which must be purchased for this class. The MyMathLab Course ID for this class is **osman505773**.

Student Assignments

Homework and quizzes/assessments will be submitted online through MyMathLab. Three (at least) major exams and the final exam will be proctored and taken in class/an HCC testing center in Houston, TX (or another approved testing center in the student's local area, for any student in the class who does not reside in the Houston area). No calculators or formula sheets will be allowed on any proctored exam, except for the Geometric Formula sheet.

Final Exam Policy in Developmental Mathematics:

The following policy was adopted by Houston Community College regarding the system-wide Final Examinations in developmental mathematics courses:

- a. Students who score less than 60% on the Final Examination or who have an overall course average less than 70% will be awarded a grade of "IP" or "F." The "IP" grade will be awarded to those students who took Math 0409 for the 1st time. The "F" grade will be awarded to those students who are repeating Math 0409.
- b. Students who score 60% or higher on the Final Examination and whose overall course average is equal to or greater than 70%, will have their grades averaged and awarded a grade based upon the standard 10 point scale.

<u>AVERAGE</u>	<u>GRADE</u>
$90\% \leq \text{Final Average} \leq 100\%$	A
$80\% \leq \text{Final Average} < 90\%$	B
$70\% \leq \text{Final Average} < 80\%$	C
$0\% \leq \text{Final Average} \leq 70\%$	IP or F

Note: The grade of "FX" is given when a student fails due to lack of attendance. A grade of "W" may be given on or before the official withdrawal date but not at the time of final grade submission.

Assessments

The assessments weights are as follows:

- Homework: 20%
- Average in-class Tests (T1+T2+T3)/ 3: 50%
- Final Exam: 30%

Final Average = 20% of HW + 50% of AT + 30% of Final Exam

Where: HW = homework
AT= Average in-class tests

HCC Policy Statement – ADA

Any student with a documented disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the Disability Services Office at his or her respective college at the beginning of each semester. Faculty members are authorized to provide only the accommodations requested by the Disability Support Services Office. Persons needing accommodations due to a documented disability should contact the ADA counselor for their college as soon as possible. For questions, please contact 713.718.8397. To visit the ADA Web site, please visit www.hccs.edu then click Future students, scroll down the page and click on the words Disability Information.

HCC Policy Statement:

Note: As with all developmental mathematics courses at HCC, **the use of a calculator during an exam is prohibited** and will be considered cheating.

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 not yet 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 be on time at the beginning of each class period. For complete information regarding Houston Community College's policies on attendance, please refer to the Student Handbook. 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 your work if you unavoidably miss a class

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. **The last day to withdraw is Tuesday, April 11, 2017.**

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

Everyone will be expected to conduct themselves with courtesy and respect in this classroom.

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

Personal Communication Device Policy:

All personal communication devices (any device with communication capabilities including but not limited to cell phones, blackberries, pagers, cameras, palmtop computers, lap tops, PDA's, radios, headsets, portable fax machines, recorders, organizers, databanks, and electronic dictionaries or translators) must be muted or turned off during class. Such activity during class time is deemed to be disruptive to the academic process. Personal communication devices are to not be on the student desk during examinations. Usage of such devices during exams is expressly prohibited during examinations and will be considered cheating (see academic honesty section above).

Student Course Reinstatement Policy:

Students have a responsibility to arrange payment for their classes when they register, either through cash, credit card, financial aid, or the installment plan. Faculty members have a responsibility to check their class rolls regularly, especially during the early weeks of a term, and reconcile the official class roll to ensure that no one is attending class whose name does not appear on it. Students who are dropped from their courses for nonpayment of tuition and fees who request reinstatement after the official date of record (OE Date) can be reinstated by making payment in full and paying an additional \$75 per course reinstatement fee. A student requesting reinstatement should present the registrar with a completed Enrollment Authorization Form with the signature of the instructor, department chair, or dean who should verify that the student has been attending class regularly. Students who are reinstated are responsible for all course policies and procedures, including attendance requirements.

Resources:

Students can get free assistance, 24 hours a day, 7 days a week, in Math, English and other subjects, at www.hccs.askonline.net . Typically, posted questions are answered by an HCC tutor or faculty within 24 hours (usually under 6 hours).

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

You may also find free tutoring at various HCCS campuses by going to Find-A-Tutor at <http://imc06.hccs.edu/alltutoring/FMPro?-db=alltutoring.fp5&-lay=info&-format=search.htm&-view>.

There are also several online math resources that you can find with an internet search. Some sample websites include:

<http://sophia.hccs.edu/~douglas.bump/math>

www.khanacademy.org

www.awl.com/tutorcenter/stinfo.html

www.Purplemath.com

www.harcourtcollege.com/math/nettutor/0030260264/

www.mhhe.com/barnett

Social Networking: DE students are encouraged to become a fan of [DE on Facebook](#) and follow [DE on Twitter](#). These social networking sites can provide a sense of community for the online learner, as well as up-to-date information and announcements related to HCC and DE.

Note to the Instructor: This course has a MyMathLab Model course associated with it. The model course ID is hccs16525.

In addition, this course has an associated EagleOnline Model course. The instructor is expected to use the EagleOnline model course. Your class should be listed as web-enhanced within Peoplesoft so that your students will have access to the EagleOnline model course. For more information on how to use the EagleOnline Model course, please complete the Faculty Training Module found on the Virtual

Faculty Lounge at hcc.edu/vfl. Select **Specialized Training**, and then **Training for Developmental Math Faculty**.
 The Teaching and Learning Program course numbers are
 TL1310 Developmental Math Faculty Training – MATH 0106
 TL1320 Developmental Math Faculty Training – MATH 0409

TENTATIVE CALENDAR

Test	Chapters Covered on Test	Date
Test #1	Units I and II	March 23, 2017
Test #2	Units III, IV and V	April 20, 2017
Test #3	Units VI, VII, VIII and IX	May 4, 2017
Final Exam	Units I to IX	Date: May 11, 2017 Time: 8:00 – 10:00 AM

Administration contact information

College - Level Math Courses

Chair of Math	Jaime Hernandez	SW Campus	713-718-7772	Stafford, Scarcella, N108
- Secretary		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.