



Mathematics Southwest

Developmental Mathematics

Math 0409: Foundations of Mathematics

CRN 42803 – Fall 2017

West Loop Center- Room C121

Meeting times and days: 11:00AM-1:20 PM, MoWe

4 hour lecture course / 64 hours per semester/ 15 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: **osman08537**

Instructor:	Osman M. Osman
Instructor Contact Information:	osman.osman@hccs.edu
Type of Instruction:	Face-to-Face
Office location and hours:	By Appointment only
Preferred Method of Contact:	By E-mail
Class Cancellation:	The department secretary will call the students in case of cancellation

Course Description

Foundations of Mathematics: Topics include real numbers, proportions, descriptive statistics, basic geometry, polynomials, factoring, linear equations, inequalities, linear models, percentage models, order of operations, set operations, and an introduction to other models which may include exponential, quadratic and/or rational models. quadratic equations and rational expressions. A departmental final examination must be passed with a score of 60% or more to pass the course. Prerequisite: MATH 0306 or equivalent test score.

Prerequisites

TSIA Reading Score above 341 or GUST 0339 with a grade of C or higher; TSIA ABE level 5 or 6; TSIA Math Score 336 – 347 with Elementary Algebra Score 5 – 15 and Intermediate Algebra Score 0 – 6; Math 0106: Pass with “C” or better

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-Calculus-based College Level Math course, specifically Math 1332 or Math 1333.

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. Demonstrate the ability to classify, add, subtract, multiply, divide, simplify, and factor polynomials
6. Apply “Proportional Reasoning” to solve related problems including ratios, rates, proportion, percent and conversions of units.
7. Recognize, examine, and interpret the linear, quadratic, exponential, and/or rational models of equations and evaluate the square roots of perfect square numbers.

Learning objectives

Students will:

- 1.1 add, subtract, multiply and divide real numbers and manipulate certain expressions.
- 1.2 solve problems using scientific notation.
- 1.3 simplify algebraic expressions
- 2.1 solve linear equations and inequalities in one variable
- 2.2 solve problems using equations and inequalities.
- 3.1 plot ordered pairs and graph linear equations.
- 3.2 find the rate of change of a line and write its equation

- 3.3 graph linear inequalities in two variables
- 4.1 find the perimeter and area of rectangles, squares, parallelograms, triangles, trapezoids and circles; volume and surface area, relations between angle measures, congruent and similar triangles, and properties of parallelograms.
- 5.1 Recognize polynomials, add, subtract, multiply, and divide polynomials
- 5.2 factor polynomials using the techniques of the greatest common factor, grouping, difference of two squares, and trinomials of the form $x^2 + bx + c$
- 6.1 multiply and divide, and simplify rational expressions
- 6.2 find ratios and solve rational equations and proportions
- 7.1 model situations with linear, quadratic, or exponential functions.
- 7.2 find square roots of perfect square numbers

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.

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.

Course Outline: The lecture schedule contained in this outline is suggested for your usage. Instructors are free to modify the schedule to meet their needs. However, all the sections listed below must be covered. It is suggested that the even numbered problems be used as examples in class and allow the students to practice the odd numbered problems for homework.

CONTENTS

(Approximate Time)

GEOMETRY (Chapter 8 and Appendix D)

(3 hours)

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

- 8.2 Perimeter
- 8.3 Area
- 8.4 Circles
- Appendix D. Introduction to Set Operations

INTRO. TO REAL NUMBERS & ALGEBRAIC EXPRESSIONS (Chapter 1)

(4 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:

- 1.1 Introduction to Algebra
- 1.2 The Real Numbers
- 1.3 Addition of Real Numbers
- 1.4 Subtraction of Real Numbers
- 1.5 Multiplication of Real Numbers

- 1.6 Division of Real Numbers
- 1.7 Properties of Real Numbers
- 1.8 Simplifying Expressions; Order of Operations

Test 1: COVERS CHAPTERS 1, 8, and Appendix D**(1.5 to 2 hours)****SOLVING EQUATIONS AND INEQUALITIES (Chapter 2)****(4 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 include working with the equality of two fractions and solving inequalities in a single variable. Listed below are the subtopics covered in this unit:

- 2.1 Solving Equations: The Addition Principle
- 2.2 Solving Equations: The Multiplication Principle
- 2.3 Using the Principles Together
- 2.4 Formulas
- 2.5 Applications of Percent
- 2.6 Applications and Problem Solving
- 2.7 Solving Inequalities
- 2.8 Applications and Problem Solving with Inequalities

GRAPHS OF LINEAR EQUATIONS AND INEQUALITIES (Chapter 3)**(3 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:

- 3.1 Graphs Linear Equations
- 3.2 More with Graphing and Intercepts
- 3.3 Slope and Applications
- 3.5 Graphing Using the Slope and the y-Intercept
- 3.7 Graphs Linear Inequalities in Two Variables

POLYNOMIALS: OPERATIONS (Chapter 4)**(4 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:

- 4.1 Integers as Exponents
- 4.2 Exponents and Scientific Notation
- 4.3 Introduction to Polynomials
- 4.4 Addition and Subtraction of Polynomials
- 4.5 Multiplication of Polynomials
- 4.6 Special Products

- 4.7 Operations with Polynomials in Several Variables
- 4.8 Division of Polynomials (Monomials Divisors Only)

Test 2: COVERS CHAPTERS 2, 3, & 4**(1.5-2 HOURS)**

POLYNOMIALS: FACTORING (Chapter 5)**(4 hours)**

This unit covers factorization of polynomials. Listed below are the subtopics covered in this unit:

- 5.1 Introduction to Factoring (GCF and Grouping)
- 5.2 Factoring Trinomials (of the type $x^2 + bx + c$ only)
- 5.5 Factoring Trinomial Squares and Differences of Squares
- 5.6 Factoring : A General Strategy (Omit $ax^2 + bx + c, a \neq 1$)

RATIONAL EXPRESSIONS AND EQUATIONS (Chapter 6)**(4 hours)**

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

- 6.1 Multiplication and Simplifying Rational Expressions (Omit $ax^2 + bx + c, a \neq 1$)
- 6.2 Division and Reciprocals (Omit $ax^2 + bx + c, a \neq 1$)
- 6.7 Solving Rational Equations (proportions only)
- 6.8 Applications Using Rational Equations and Proportions (proportions only)

RADICAL EXPRESSIONS AND EQUATIONS (Chapter 7)**(4 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:

- 7.1 Introduction to Radical Expressions (Perfect Square Radicands Only)

LINEAR, QUADRATIC, AND EXPONENTIAL MODELING**(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:

- Linear modeling
- Quadratic modeling
- Exponential modeling

Test 3: COVERS CHAPTERS 5, 6, 7, & Modeling Unit**(1.5-2 HOURS)**

TENTATIVE CALENDAR

Test	Chapters Covered on Test	Date
Test #1	Chapters 1, 8 and appendix D	10/18/2017
Test #2	Chapters 2, 3, & 4	11/15/2017
Test #3	Chapters 5, 6, 7, & Modeling Unit	12/6/2017
Final Exam	Chapters 1, 2, 3, 4, 5, 6, 7, 8, appendix D and modeling unit	Date: 12/11/2017 Time: 11:00 AM– 12:50 PM

“Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students for support. Furthermore, please notify the professor if you are comfortable in doing so.”

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 **osman08537**.

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.

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
- Describe the requirements 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.

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 to 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

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 below).

Calculator Policy: As with all developmental mathematics courses at HCC, **the use of a calculator during an exam is prohibited** and will be considered cheating (see academic honesty section below).

Student's Assessments

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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

Make-up policy:

There are no make-up exams, unless student have a legitimate reason.

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.

HCC Grading Scale:

A = 100 – 90.....	4 points per semester hour
B = 89 – 80.....	3 points per semester hour
C = 79 – 70.....	2 points per semester hour
69 and below = F or IP.....	.0 points per semester hour
IP (In Progress)	0 points per semester hour
W(Withdrawn)	0 points per semester hour
I (Incomplete).....	.0 points per semester hour
AUD (Audit)	0 points per semester hour

IP (In Progress) is given only in certain developmental courses. The student must re-enroll to receive credit. COM (Completed) is given in non-credit and continuing education courses. To compute grade point average (GPA), divide the total grade points by the total number of semester hours attempted. The grades "IP," "COM" and "I" do not affect GPA.

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.

HCC Policy Statement – ADA, Academic Honesty, Student Attendance, 3-peaters, Withdrawal Deadline

Access Student Services Policies on their Web site: <http://www.hccs.edu/district/students/student-handbook/>

HCC strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please meet with a campus Abilities Counselor as soon as possible in order to establish reasonable accommodations. Reasonable accommodations are established through an interactive process between you, your instructor(s) and Ability Services. It is the policy and practice of HCC to create inclusive and accessible learning environments consistent with federal and state law. For more information, please go to <http://www.hccs.edu/district/students/disability-services/> . **The last day to withdraw is Monday, November 13, 2017.**

Campus Carry Policy: At HCC the safety of our students, staff, and faculty is our first priority. As of August 1, 2017, Houston Community College is subject to the Campus Carry Law (SB11 2015). For more information, visit the HCC Campus Carry web page at <http://www.hccs.edu/district/departments/police/campus-carry/>.”

Resource Materials: In addition, this course has an associated CANVAS Model course. Course materials are available within the CANVAS Course Management System. Any student enrolled in Math 0409 at HCC has access to the Learning Resource Center (LRC) where they may get additional help in understanding the theory or in improving their skills. The LRC is staffed with mathematics faculty and/or student assistants, and offers tutorial help, videos and computer-assisted drills.

HCC Policy Statement: Sexual Misconduct

Houston Community College is committed to cultivating an environment free from inappropriate conduct of a sexual or gender-based nature including sex discrimination, sexual assault, sexual harassment, and sexual violence. Sex discrimination includes all forms of sexual and gender-based misconduct and violates an individual’s fundamental rights and personal dignity. Title IX prohibits discrimination on the basis of sex-including pregnancy and parental status-in educational programs and activities. If you require an accommodation due to pregnancy please contact an Abilities Services Counselor. The Director of EEO/Compliance is designated as the Title IX Coordinator and Section 504 Coordinator. All inquiries concerning HCC policies, compliance with applicable laws, statutes, and regulations (such as Title VI, Title IX, and Section 504), and complaints may be directed to:

David Cross
Director EEO/Compliance
Office of Institutional Equity & Diversity
3100 Main
Houston, TX 77266-7517 or Institutional.Equity@hccs.edu

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:

The HCC Tutoring Centers provide free tutoring for individual subjects offered at specific times throughout the week on various campuses. There is no need to make an appointment. If you need a tutor, visit: www.hccs.edu/findatutor for times and locations. For more information about tutoring at HCC, visit www.hccs.edu/district/students/tutoring.

Additional help is also available through Student Support Services. Students can get free assistance, 24 hours a day, 7 days a week, in Math, English and other subjects, at <https://hccs.upswing.io/>. Typically, posted questions are answered by an HCC tutor

or faculty within 24 hours (usually under 6 hours). There are also several online math resources that you can find with an internet search. You may also find information on the Learning Web site accessible through your specific HCCS campus website.

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	Clen Vance	CE Campus	713-718-6421	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
Technical Support Specialist	Hien Nguyen	NE Campus	713-718-2440	Northline Building, Rm 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.