Math 0409: Foundations of Mathematics
CRN 48199 – Spring 2015
Scarcella Building Mon and Wed 7 – 9 P.M.
4 hour lecture course +0 hour lab / 64 hours per semester/ 16 weeks
Textbook: Prealgebra and Introductory Algebra (3rd Ed) by Bittinger, Ellenbogen, Beecher and Johnson
ISBN-13: 9780321731715

Course ID: ranjbaran50312

2Instructor: Farah Ranjbaran

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Office location and hours: By appointment only

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 in order to pas s 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. 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.

CALENDAR

TOPIC	Approximate Time

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, intersection, and complement. Listed below are the subtopics covered in this unit:

8.2   Perimeter

8.3   Area

8.4   Circles

Appendix E. Introduction to Set Operations

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:

9.1   Introduction to Algebra

9.2   The Real Numbers

9.3   Addition of Real Numbers

9.4   Subtraction of Real Numbers

9.5   Multiplication of Real Numbers

9.6   Division of Real Numbers

9.7   Properties of Real Numbers

9.8   Simplifying Expressions; Order of Operations

RECOMMEND EXAMINATION I: **COVERS UNITS I & II**	*(1.5 to 2 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 include working with the equality of two fractions and solving inequalities in a single variable. Listed below are the subtopics covered in this unit:

10.1 Solving Equations: The Addition Principle

10.2 Solving Equations: The Multiplication Principle

10.3 Using the Principles Together

10.4 Formulas

10.5 Applications of Percent

10.6 Applications and Problem Solving

10.7 Solving Inequalities

10.8 Applications and Problem Solving with Inequalities

TOPIC   **Approximate Time**

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:

11.1 Graphs Linear Equations

11.2 More with Graphing and Intercepts

11.3 Slope and Applications

11.5 Graphing Using the Slope and the y-Intercept

11.7 Graph Linear Inequalities in Two Variables

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:

12.1 Integers as Exponents

12.2 Exponents and Scientific Notation

12.3 Introduction to Polynomials

12.4 Addition and Subtraction of Polynomials

12.5 Multiplication of Polynomials

12.6 Special Products

12.7 Operations with Polynomials in Several Variables

12.8 Division of Polynomials (Monomials Divisors Only)

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

POLYNOMIALS: FACTORING (Unit VI)   **(6 hours)**

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

13.1 Introduction to Factoring (GCF and Grouping)

13.2 Factoring Trinomials (of the type x2 + bx + c only)

13.5 Factoring Trinomial Squares and Differences of Squares

13.6 Factoring : A General Strategy (Omit $ax^2 + bx + c$, a≠1)

RATIONAL EXPRESSIONS AND EQUATIONS (Unit VII)   **(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:

14.1 Multiplication and Simplifying Rational Expressions (Omit $ax^2 + bx + c$, $a \neq 1$)

14.2 Division and Reciprocals (Omit $ax^2 + bx + c$, $a \neq 1$)

14.7 Rational Equations and applications (Proportions only)

RADICAL EXPRESSIONS AND EQUATIONS (Unit VIII)   **(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:

16.1 Introduction to Radical Expressions (Include Perfect Square Radicands Only)

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.

Linear modeling

Quadratic modeling

Exponential modeling

Instructional Methods
This is an on campus class. While you will be logging into Eagle Online for notes, announcements and other important information on a weekly basis, 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 ranjbaran50312**

Technical Support
If you should experience technical difficulties during the semester, these problems are not under the control of the instructor. Such technical problems should be directed to technical support. For Eagle Online tech support, go to the HCC Eagle Online support website call 713-718-2000, options 4, 2, 3 (available 24 x 7). For MyMathLab tech support call 1-800-677-6337 or 1-888-695-6577.

Student Assignments
Homework and quizzes/assessments will be submitted online through MyMathLab. Four major exams and the final exam will be proctored and taken in class. ***No calculators or formula sheets will be allowed on any proctored exam***.

Final Exam Policy in Developmental Mathematics

The final letter grade will be determined accordingly:

    a. **Students who score less than 50% on the Final Examination will be awarded a course grade of "F."**

    b. Students who score greater than or equal to 50% and less than 60% on the Final Examination will be awarded a grade of "D" or "F." The "D" grade will be awarded to those whose overall average is greater than or equal to 60%. The "F" grade will be awarded to those whose overall average is less than 60%.

    c. A student whose score is greater than or equal to 60% on the Final Examination will have their grades averaged and awarded a grade based upon the standard 10 point scale.

AVERAGE	GRADE
$90\% \leq$ Final Average $\leq 100\%$	A
$80\% \leq$ Final Average $< 90\%$	B
$70\% \leq$ Final Average $< 80\%$	C
$60\% \leq$ Final Average $< 70\%$	D
Final Average $< 60\%$	F
Excessive Absences and failing	FX

Note: The instructor cannot assign a grade of IP or W. The grade of "FX" is given when a student fails due to lack of attendance.

Assessment
There will be 4 major exams, Mathlab homework grade, and a final departmental exam. All exams taken in the classroom will be graded and returned to students within a week. If you perform below your expectations or fail any test, please set-up a conference with the instructor as soon as possible.

Grading policy:
You will have a total of 6 exam grades. Four exam taken in the classroom. Your mathlab homework grade will count as the fifth exam grade, which has the exact same weight as your other exams plus the final exam.
The lowest grade out of the five exam (not the final) will be dropped. 70 percent of the reaming exams average plus 30 percent of the final exam grade will determine the semester grade. The formula is as follows:

    (E1 + E2 + E3 + E)/4 * 70% + 30% *Final Exam = Semester Grade

MAKE - UP EXAM POLICY
There will be ***NO MAKE-UP EXAM***. If a student is absent for a test, it will count as a zero. The zero will be considered the lowest score, which will be dropped.

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 John Reno at 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.

Southeast Campus: John Reno, ADA Counselor
6815 Rustic St.
Houston, TX 77087
713-718-8397

HCC Policy Statement: Academic Honesty

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 on March 30th   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.

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

Instructor Requirements - Homework
Students are expected to submit homework online through MyMathLab by the designated due dates and take all exams <u>IN PERSON</u> during the scheduled testing dates.

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:

Tutoring: Free tutoring is available at the Eastside campus in the Tutoring Assistance Center, room 203, Felix Morales Bldg. (713)718-2694 (enter your campus tutoring location). Additional help is also available through http://m.se.hccs.edu/index.php and through Student Support Services.

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://digitalvellum.next.ecollege.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.

Tentative schedule for Foundation of Mathematics, Math 0409 – Spring 2015

January 21	**8.2** Perimeter
	8.3 Area
January 26	**8.4** Circles
	9.1 Introduction to Algebra
January 28	**9.2** The Real Numbers
	9.3 Addition of Real Numbers
February 2	**9.4** Subtraction of Real Numbers
	9.5 Multiplication of Real Numbers
	9.6 Division of Real Numbers
February 4	**9.7** Properties of Real Numbers
	9.8 Simplifying Expressions; Order of Operations
February 9	**Test #1 - Chapters 8 & 9**

February 11   **10.1** Solving Equations: The Addition Principle

                    10.2 Solving Equations: The Multiplication Principle

                    10.3 Using the Principles Together

February 16   President Day

February 18   **10.4** Formulas

                    10.5 Applications of Percent

                    10.6 Applications and Problem Solving

February 23   **10.7** Solving Inequalities

                    10.8 Applications and Problem Solving with Inequalities

February 25   **11.1** Graphs Linear Equations

                    11.2 More with Graphing and Intercepts

March 2   **11.3** Slope and Applications

                    11.5 Graphing Using the Slope and the y-Intercept

March 4   **11.7** Graph Linear Inequalities in Two Variables

March 9   Test #2 – Chapters 10 & 11

March 11   **12.1** Integers as Exponents

                    12.2 Exponents and Scientific Notation

**March
16-22   Happy Spring Break**

March 23   **12.3** Introduction to Polynomials

                    12.4 Addition and Subtraction of Polynomials

March 25   **12.5** Multiplication of Polynomials

                    12.6 Special Products

March 30   **12.7** Operations with Polynomials in Several Variables

                    12.8 Division of Polynomials (Monomials Divisors Only)

April 6   **13.1** Introduction to Factoring (GCF and Grouping)

13.2 Factoring Trinomials (of the type x2 + bx + c only)

April 8 **13.5** Factoring Trinomial Squares and Differences of Squares

April 13 **13.6** Factoring : A General Strategy (Omit $ax^2 + bx + c$, a≠1)

April 15 *Test Review*

April 20 **Test # 3 – Chapters 12 & 13**

April 22 **14.1** Multiplication and Simplifying Rational Expressions (Omit $ax^2 + bx + c$, a≠1)
14.2 Division and Reciprocals (Omit $ax^2 + bx + c$, a≠1)

April27 **14.7** Rational Equations and applications (Proportions only)

April 29 **16.1** Introduction to Radical Expressions (Include Perfect Square Radicands Only)

May 4 **Test #4 – Chapters 14 & 16**
May 6 **Final Exam Review**

May 13   Final Exam – May 13, 7 to 9 P.M.

Important Dates: Drop Deadline: Monday, March 30th by 4:30 p.m.
Remember, you must have counselor approval 24 hours prior to dropping the course.
Final Exam Review Session   TBA