Instructor: Adnan Ulhaque

Contact Information
Please feel free to contact me concerning any problems that you are experiencing in this course. I am available to hear your concerns, and to discuss course topics. You do not need to wait until you have received a poor grade before asking for my assistance. Your performance in my class is very important to me. My e-mail is: adnan.ulhaque@hccs.edu. I check my email regularly. I will do my best to reply within 24 hours. Always include your full name, course name, CRN, and course term. You need to check your HCC email account on regular basis, as I will be sending important announcements and updates.

Course Description
Topics include factoring techniques, radicals, algebraic fractions, absolute values, complex numbers, graphing linear equations and inequalities, quadratic equations, systems of equations, graphing quadratic equations and an introduction to functions. Emphasis is placed on algebraic techniques, in order to successfully complete Math 1314 College Algebra, Math 1324 Mathematics for Business & Social Sciences, Math 1342 Statistics, or Math 1332 Mathematics for Liberal Arts. A Departmental Final examination must be passed with a score of 60% or more in order to pass this course.

Prerequisites
Math 0409: Pass with "C" or better; or equivalent score on the placement exam.

Course Goal
This is the final course in the developmental mathematics sequence and its purpose is to prepare students for entry level college math.

Course Student Learning Outcomes (SLO)
1. Define, represent, and perform operations on real and complex numbers.
2. Recognize, understand, and analyze features of a function.
3. Recognize and use algebraic (field) properties, concepts, procedures (including factoring), and algorithms to combine, transform, and evaluate absolute value, polynomial, radical, and rational expressions.
4. Identify and solve absolute value, polynomial, radical, and rational equations.
5. Identify and solve absolute value and linear inequalities.
7. Connect and use multiple strands of mathematics in situations and problems, as well as in the study of other disciplines.

Learning outcomes
Students will:
1. add, subtract, multiply and divide polynomials
2. factor polynomials
3. add, subtract, multiply and divide rational expressions
4. simplify complex fractions
5. solve equations involving rational expressions
6. simplify equations involving rational exponents and simplify radicals
7. add, subtract, multiply, divide expressions involving radicals and solve radical equations
8. add, subtract, multiply and divide complex numbers
9. solve quadratic equations by factoring, completing the square, quadratic formula and square root property
10. solve systems of linear equations in two variables
11. solve absolute value equations
12. solve absolute value inequalities
13. graph linear equations & linear inequalities in two variables
14. find the slope of a line & write its equation
15. graph quadratic functions and inequalities
16. solve word problems
17. recognize functional notation & evaluate functions

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.

CALENDAR

CHAPTER

1  LINEAR EQUATIONS, INEQUALITIES, AND APPLICATIONS

Topics to be covered include: linear equations in one variable and formulas with applications. The unit concludes with absolute value equations and inequalities.

1.1 Linear Equations in One Variable .................................................................................. 44
1.5 Linear Inequalities in One Variable ................................................................................. 90
1.7 Absolute Value Equations and Inequalities .................................................................. 111

2  LINEAR EQUATIONS, GRAPHS, AND FUNCTIONS

Topics to be covered include: graphing lines in the coordinate plane, the slope of a line, equations of a line, linear inequalities and their graphs, relations and functions. The section concludes with variation.

2.1 Linear Equations in Two Variables .................................................................................. 136
2.2 The Slope of a Line ......................................................................................................... 148
2.3 Writing Equations of Lines ............................................................................................ 162
2.4 Linear Inequalities in Two Variables .............................................................................. 179
2.5 Introduction to Relations and Functions ........................................................................ 186
2.6 Functional Notation and Linear Functions .................................................................... 197

3  SYSTEMS OF LINEAR EQUATIONS

Topics to be covered include: solving systems by graphing, elimination, and substitution methods. This unit only considers a two by two systems of linear equation.

3.1 Systems of Linear Equations in Two Variables ............................................................. 216
4  EXPONENTS, POLYNOMIALS, & POLYNOMIAL FUNCTIONS

Topics to be covered include: integer exponents, scientific notation, polynomial functions. This unit concludes with multiplying, and dividing polynomials. You do not need to cover the polynomial graphs and composition from section 4.3.

4.4  Multiplying Polynomials ................................................................. 298
4.5  Dividing Polynomials ..................................................................... 307

5  FACTORING

Topics to be covered include: factoring out the GCF, factoring the difference of two squares, factoring the general trinomial, factoring the sum and difference of two cubes, and factoring by grouping.

5.1  Greatest Common Factors; Factoring by Grouping .......................................................... 324
5.2  Factoring Trinomials ........................................................................ 330
5.3  Special Factoring ............................................................................. 338
5.4  A General Approach to Factoring ..................................................... 344
5.5  Solving Equations by the Zero-Factor Property .................................. 349

6  RATIONAL EXPRESSIONS AND FUNCTIONS

Topics to be covered include: rational expressions and functions; multiplying, dividing, adding and subtracting rational expressions; complex fractions. The unit concludes with equations involving rational expressions and applications of rational expressions. Graphing rational functions is not included.

6.1  Rational Expressions and Functions; Multiplying and Dividing ............... 366
6.2  Adding and Subtracting Rational Expressions ........................................ 376
6.3  Complex Fractions ............................................................................ 385
6.4  Equations with Rational Expressions and Graphs .................................. 391
6.5  Applications of Rational Expressions .................................................. 400

7  ROOTS, RADICALS, AND ROOT FUNCTIONS

Topics to be covered include: Radical expressions and exponents; simplifying radical expressions; adding, subtracting, multiplying and dividing radical expressions; solving equations involving radical expressions. This unit concludes with complex numbers. Graphing radical functions is not included.

7.1  Radical Expressions and Graphs ......................................................... 434
7.2  Rational Exponents ............................................................................ 442
7.3  Simplifying Radicals, the Distance Formula, and Circles ....................... 450
7.4  Adding and Subtracting Radical Expressions ....................................... 463
7.5  Multiplying and Dividing Radical Expressions ..................................... 468
7.6  Solving Equations with Radicals ........................................................ 479
7.7 Complex Numbers

8 QUADRATIC EQUATIONS, INEQUALITIES, & FUNCTIONS

Topics to be covered include: solving quadratic equations by the square root property, completing the square, and the quadratic formula; vertical parabolas.

8.1 The Square Root Property and Completing the Square

8.2 The Quadratic Formula

8.6 More about Parabolas; Application (omit horizontal parabolas)

APP GRAPHING QUADRATIC INEQUALITIES

Appendix: Graphing Quadratic Inequalities

Topics to be covered include: second degree inequalities whose graphs involve circles and parabolas only.

APPENDIX Graphing Quadratic Inequalities

Instructional Methods

This is an online class. While you will be logging into Canvas System 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 will be given when the course starts.

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 MyMathLab tech support call 1-800-677-6337 or 1-888-695-6577.

Student Assignments

Homework 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.

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 0312 for the 1st time. The “F” grade will be awarded to those students who are repeating Math 0312.

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.

<table>
<thead>
<tr>
<th>AVERAGE</th>
<th>GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>90% ≤ Final Average ≤ 100%</td>
<td>A</td>
</tr>
<tr>
<td>80% ≤ Final Average &lt; 90%</td>
<td>B</td>
</tr>
<tr>
<td>70% ≤ Final Average &lt; 80%</td>
<td>C</td>
</tr>
<tr>
<td>0% ≤ Final Average ≤ 70%</td>
<td>IP or F</td>
</tr>
</tbody>
</table>

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.
The second and the final exam will be proctored at a testing center.

For your course grade, the scores from your homework, three major tests, and the final examination will be taken into consideration as shown in the following formula.

Final Average = \( \frac{\text{Exam 1} + \text{Exam 2} + \text{Exam 3} + \text{My Math Lab Home Work} + \text{Final} + \text{Final}}{6} \)

HCC Policy Statement - ADA

Services to Students with Disabilities

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 at 713.718.5165. 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: 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.edurisksolutions.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

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 means 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 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.

**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.

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:
Free tutoring is available in HCC campuses. 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 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](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](http://sophia.hccs.edu/~douglas.bump/math)
- [www.khanacademy.org](http://www.khanacademy.org)
- [www.Purplemath.com](http://www.Purplemath.com)
- [www.mhhe.com/barnett](http://www.mhhe.com/barnett)

**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](http://www.hccs.edu/EGLS3) for more information.

**Administration contact information**

<table>
<thead>
<tr>
<th>College - Level Math Courses</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chair of Math</strong> Jaime Hernandez</td>
<td>SW Campus 713-718-2477</td>
</tr>
<tr>
<td>- <strong>Secretary</strong> Tiffany Pham</td>
<td>SW Campus 713-718-7770</td>
</tr>
<tr>
<td><strong>Math Assoc. Chair</strong> Clen Vance</td>
<td>CE Campus 713-718-6421</td>
</tr>
<tr>
<td><strong>Math Assoc. Chair</strong> Ernest Lowery</td>
<td>NW Campus 713-718-5512</td>
</tr>
<tr>
<td><strong>Math Assoc. Chair</strong> Mahmoud Basharat</td>
<td>NE Campus 713-718-2438</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Developmental Math Courses</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chair of Dev. Math</strong> Susan Fife</td>
<td>SE Campus 713-718-7241</td>
</tr>
<tr>
<td>- <strong>Secretary</strong> Carmen Vasquez</td>
<td>SE Campus 713-718-7056</td>
</tr>
<tr>
<td><strong>Dev. Math Assoc. Chair</strong> Marisol Montemayor</td>
<td>SE Campus 713-718-7153</td>
</tr>
<tr>
<td><strong>Dev. Math Assoc. Chair</strong> Jack Hatton</td>
<td>NE Campus 713-718-2434</td>
</tr>
<tr>
<td><strong>Technical Support Specialist</strong> Hien Nguyen</td>
<td>NE Campus 713-718-2440</td>
</tr>
</tbody>
</table>

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.