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## MATH 0312: Intermediate Algebra

CRN 16266 – SUMMER II /2016

Textbook: Introductory and Intermediate Algebra – Custom Edition, Pearson Learning Solutions

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MyMathLab Course ID: **TBA via email**

**Instructor:** Charles Gabi

**Instructor Contact Information:** email:Charles.gabi@hccs.edu, office number: 713 718 2435.

**Office location and hours:** Northline Rm. 321

### 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. Solve algebraic equations and inequalities involving rational expressions, radicals, quadratics, absolute values, or linear expressions.
2. Examine and interpret the linear and quadratic graphs of equations and inequalities.
3. Solve application problems.
4. Use and interpret function notation in both algebraic and graphical contexts.

### 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

## CALENDAR

### Tentative Test Schedule:

Test	Chapters Covered on Test	Date
Test #1	1.1, 1.2, 1.3, 1.5, 1.7, 2.1, 2.2, 2.3, 2.3, 2.4, 2.5, 2.6, 3.1	7/21/16 Proctored (3100 Main)  7/22 – 7/23 Proctored Central Campus SJAC 335/385
Test #2	4.1, 4.3, 4.4, 4.5, 5.1, 5.2, 5.3, 5.4, 5.5, 6.1, 6.2, 6.3	7/29 – 7/30 Online
Test #3	6.4, 6.5, 7.1, 7.2, 7.3, 7.4, 7.5, 7.7, 8.1, 8.2, 8.6, Appendix (Graphing Quadratic Inequalities.	8/7/16 to 8/11/16 Online
Final Exam	Comprehensive	8/11/16 Proctored (3100 Main)  8/12 – 8/13 Central Campus SJAC 335

#### Instructional Methods

The instructor will strive to facilitate an effective learning environment through lectures, classroom practice activities, discussions, and review sessions.

#### Student Assignments

There are Three (3) exams, 100 points each and worth 60% of your total grade. Each exam is worth 20%. You need to have completed all the corresponding homework with at least an 80% to be able to take a test. You are expected to keep a notebook with all your homework and notes. All work should be labeled by sections.

#### **Make-up policy:**

There are no make-ups for missed exams or quizzes. Test schedule is given at least a week in advance.

#### 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:

If a student scores less than a 60% on the Final Exam, then the student receives an F in the course. If a student scores at least a 60% on the Final Exam, then the grades will be averaged in accordance with the grade calculation formula as stated on the student syllabus; i.e., the student earns an A, B, C, or F in the course.

#### Assessments

**Hm. Wk(15%) + 3 Exams (20%) + Finals +(25%) = Grade.**

## 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 Donna Price at 713.718.5165. To visit the ADA Web site, please visit [www.hccs.edu](http://www.hccs.edu) then click Future students, scroll down the page and click on the words Disability Information.

To make an appointment, please call 713-718-7910. Professors are authorized to provide only the accommodations requested by the Disability Support Office.

### **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 student's 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. **A student has to be actively involved in completing homework assignments in MyMathlab to be attendance compliant.**

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. **(8/1/16)**

### **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**

**Be respectful of all people all the time.**

### **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

### **Grading Scale**

90 - 100 = A

80 - 89 = B

70 - 79 = C

00 - 69 = F (or less than 60% in the final exam)

Note: The instructor cannot assign a grade of D, IP or W.

### **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 **enter your campus tutoring location**. Additional help is also available through **enter campus specific student resource location** 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](http://www.hccs.askonline.net). 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.

**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.

<b>CHAPTER</b>	<b>Approximate</b>
<b>Time</b>	
<b>SECTION NUMBERS</b>	<b>TOPICS</b>
<b>1</b>	<b>LINEAR EQUATIONS, INEQUALITIES, AND APPLICATIONS</b> <span style="float: right;"><i>(4 hours)</i></span>
<i>Topics to be covered include:</i> linear equations in one variable and formulas with applications. The unit concludes with absolute value equations and inequalities.	
<b>1.1</b>	<b>Linear Equations in One Variable</b> ..... 44
<b>1.2</b>	<b>Formulas and Percent</b> ..... 54
<b>1.3</b>	<b>Applications of Linear Equations</b> ..... 66
<b>1.5</b>	<b>Linear Inequalities in One Variable</b> ..... 90
<b>1.7</b>	<b>Absolute Value Equations and Inequalities</b> ..... 111

**2** **LINEAR EQUATIONS, GRAPHS, AND FUNCTIONS** *(6 hours)*

*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.

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

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**RECOMMEND EXAMINATION 1: COVERS CHAPTER 1 & 2** (1 to 1.5 hours)

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**3**      **SYSTEMS OF LINEAR EQUATIONS** (1.5 hours)

*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.

<b>3.1</b>	<b>Systems of Linear Equations in Two Variables</b> .....	216
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**4**      **EXPONENTS, POLYNOMIALS, & POLYNOMIAL FUNCTIONS** (6 hours)

*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.

<b>4.1</b>	<b>Integer Exponents and Scientific Notation</b> .....	266
<b>4.3</b>	<b>Polynomial Functions</b> .....	286
<b>4.4</b>	<b>Multiplying Polynomials</b> .....	298
<b>4.5</b>	<b>Dividing Polynomials</b> .....	307

**5**      **FACTORING** (6 hours)

*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.

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

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**RECOMMEND EXAMINATION 2: COVERS CHAPTERS 3, 4, & 5** (1 to 1.5 hours)

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## **6**      **RATIONAL EXPRESSIONS AND FUNCTIONS** (6 hours)

*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.

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

## **7**      **ROOTS, RADICALS, AND ROOT FUNCTIONS** (6 hours)

*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.

<b>7.1 Radical Expressions and Graphs</b> .....	434
<b>7.2 Rational Exponents</b> .....	442
<b>7.3 Simplifying Radicals, the Distance Formula, and Circles</b> .....	450
<b>7.4 Adding and Subtracting Radical Expressions</b> .....	463
<b>7.5 Multiplying and Dividing Radical Expressions</b> .....	468
<b>7.6 Solving Equations with Radicals</b> .....	479
<b>7.7 Complex Numbers</b> .....	485

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**RECOMMEND EXAMINATION 3: COVERS CHAPTERS 6 & 7** **(1 to 1.5 hours)**

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## **8** QUADRATIC EQUATIONS, INEQUALITIES, & FUNCTIONS (3 hours)

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

<b>8.1 The Square Root Property and Completing the Square</b> .....	496
<b>8.2 The Quadratic Formula</b> .....	505
<b>8.6 More about Parabolas; Application (omit horizontal parabolas)</b> .....	541

## **APP** GRAPHING QUADRATIC INEQUALITIES (1.5 hours)

**Appendix: Graphing Quadratic Inequalities** (1.5 hours)

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

<b>APPENDIX Graphing Quadratic Inequalities</b> .....	664
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**RECOMMEND EXAMINATION 4: CHAPTER 8 & Appendix** (1 to 1.5 hours)

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**REFVIEW FOR FINAL EXAMINATION: CHAPTERS 1 – 8 & Appendix** (1 to 1.5 hours)

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**COMPREHENSIVE FINAL EXAMINATION: CHAPTERS 1 – 8 & App.** (1 to 1.5 hours)

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**Administration contact information**

**College - Level Math Courses**

Chair of Math	Jaime Hernandez	SW Campus	713-718-2477	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.