MATD 0390
Intermediate Algebra
2006 - 2007

The co-chairs of the MATD 0390 committee are Bob Quigley (223-2062, bobquig@austincc.edu), and Karen Chaka (223-2095 kchaka@austincc.edu) The remaining members of the committee for the current semester may be found at http://www.austincc.edu/mthdept5/mman06/cdocs/coursecommittees

This course is offered in three different formats that use two different sets of course materials. Intermediate Algebra: Concepts and Applications by Bittinger and Ellenbogen will be used in the lecture MATD 0390 classes. The computer-mediated and distance-learning sections will use materials from Plato.

This chapter of the Math Manual contains:
- Notes for Instructors for all sections
- Course objectives for all sections, copies of which should be included in student handout material
- Departmental handout on "Prerequisites for Calculus" for all sections
- Sample Instructor Handout
- Additional Notes for Instructors for non-computer-mediated sections for the Bittinger text
- Suggested homework for non-computer-mediated sections for the Bittinger text
- Departmental First Day Handout for Students handout for non-computer-mediated sections
- Additional Notes for Instructors for computer-mediated sections
- Departmental First-Day Handout for Students handout for computer-mediated sections
- Homework for computer-mediated sections

NOTE: Required Student Supplements for computer-mediated sections are posted at http://www.austincc.edu/jbickham/mediated.

First Step: Determine whether you are scheduled to teach a computer-mediated section or a regular lecture section. Do not assume that someone else will tell you if you are scheduled for a computer-mediated section. Check the web version of the schedule for the notes on individual sections that indicate which are computer-mediated. If you can't tell whether the computer-mediated sections have been identified in the schedule yet, check with the Department Chair.

Notes for Instructors for All Sections

The two courses of Elementary Algebra (MATD 0370) and Intermediate Algebra (MATD 0390) will be taught using separate texts rather than a combined book. The chapter-by-chapter comments clarify this and indicate areas where students may need extra work.

Course Purpose: This course is designed to prepare students for various college-level science and mathematics courses. After succeeding in this course, students may enroll in a number of courses in science, mathematics, and various technical areas. These include General College Physics, General Chemistry, Magnetism and DC Circuits, AC Circuits, Manufacturing Materials and Processes, Math for Business and Economics, and College Algebra. The department no longer allows students who do very well in MATD 0390 to enroll in Trigonometry without taking College Algebra.
First Day Handouts:
Please read the material at the front of this Math Manual for more information about things you need to know to start the semester. The following are required first-day handouts unless otherwise noted. The wording in some required policy statements must be included “as is,” others have suggested versions that may be modified by the instructor, and others are to be created by the instructor. The “as is” and recommended versions are noted below. See syllabus requirements at www.austincc.edu/acadprog/02-03/syll let.htm

The handouts given to students must include the policy statements and items listed below. Refer to the first part of the manual www.austincc.edu/mthdept5/mman06/statements.html for the required wording of the “as is” policies.

Policies to be included with “as is” wording
College requirements
1. Statement of Students with Disabilities
2. Statement on Scholastic Dishonesty

Department requirements
3. Statement of Prerequisite Requirements
4. TSI Warning
5. “Prerequisites for Calculus” handout (Included in the Math Manual)
The handout has been revised to reflect the department’s mandate that students take College Algebra before taking Trigonometry, even if they did very well in Intermediate Algebra.

Policies with recommended wording that each instructor must include but may modify
6. Penalty for Scholastic Dishonesty
7. Statement on Academic Freedom / Freedom of Expression
8. Attendance Policy
9. Withdrawal Policy (It is strongly recommended that instructors indicate that they MAY withdraw students but do not promise to do so and that instructors withdraw any student, whether TSI mandated or not, who has excessive absences.)
10. Incomplete Grade Policy
11. Course-specific Support Services
12. Student Discipline Policy

First Day Handout for Students – Versions of this handout for both lecture and computer-mediated classes may be found in this section of the Math Manual and they each include a place for all of the required policy statements. The one document is meant to consolidate the departmental and instructor versions used in prior years. Revisions to the handout for computer-mediated sections may be posted before each semester. Check the Math Manual Online before you prepare your handout for a computer-mediated section.

In addition to the policy statements mentioned above, the handout must contain information including:
1. your name, ACC phone number, office hours and location, information on how conferences outside of office hours can be arranged, email address, and web page (if any)
2. your testing, homework, and grading policies

Additionally, the handout should include the instructor-written policy statements listed below.
1. missed exam policy
2. policy about late work
3. class participation expectations
4. reinstatement policy
The following are descriptions of other information that each instructor should include in first-day handouts.

**Course Objectives** – Printed course objectives should be included in your first day handouts. The departmental objectives for MATD 0390 can be found at [www2.austin.cc.tx.us/mthdept2/tfcourses/obj0390.htm](http://www2.austin.cc.tx.us/mthdept2/tfcourses/obj0390.htm).

**Prerequisite Review** (Optional) – You may use the Review if you choose to review for the Pretest. Prerequisite review sheets are available on the web.

**Pretest** – Check with the mathematics campus office to find the current version of the Pretest. Some instructors prefer to review the first day and wait until the second day of classes to give this to the students. All instructors should give the pretest. See the material in the first part of the *Math Manual* about how the pretests will be handled.

**Student Information Sheet** - Use the two-page version in the beginning pages of this *Math Manual*. Developmental Math students should be asked to complete this form and return it to you.

**Suggested Homework Assignments** (Optional) – For both non-computer-mediated and computer-mediated sections, the suggested homework assignments may be found in this section of the *Math Manual*. You may create your own list of homework problems in lieu of those suggested in either lecture or computer-mediated classes, but the level of rigor in the course should be the same as that reflected in the suggested homework assignments.

**Students**: Most students in this course fall into one of two groups. Some are coming fairly directly from Elementary Algebra either at ACC or at another college. Others had two years of algebra in high school but do not remember it well enough to enroll in an algebra-intensive mathematics, science, or technology course. Typically, students in this course need help with time management, with appropriate use of examples and solution manuals, and with test preparation skills. Some may have test anxiety or math anxiety. In this course particularly, the students who need your help most may be quiet and inclined to just disappear when they get behind or overwhelmed. Look through the Study Skills material just before MATD 0330 in this *Math Manual*. It is important that you help your students with all of these issues.

**Calculators**: Students are encouraged to use a scientific calculator throughout the course and one is required for the material on exponents and exponential functions. The use of graphing calculators should be limited to demonstrations and are not required for this course.

**Appropriate Course Placement**: Because of the TSI law, placement into the appropriate math course is very important, particularly for students taking their first math course in college. Experience has shown that assessment tests do not always place students into the appropriate course. Pretests are given and graded the first week to ensure that students are in the appropriate course. If students change courses, they must do so before the deadline for adding and dropping courses. **Instructors cannot move TSI mandated students to college level classes**. When you are determining whether to recommend a change in placement, talk to the student, and consider the following factors:

- student's previous math experiences
- time elapsed since taking math
- student's current work load and course load (time available to devote to math)
- pretest score
- assessment score
- student's initiative and determination

Because two different classroom-based delivery methods for the course are offered (lecture and computer-mediated), it is very important to determine as soon as possible whether any of the students would be better served by taking the course in the other format. In the computer-mediated
classes, have the students try the software as early as possible, usually by taking the software tour provided and beginning the lessons on the first day. For students in lecture courses who think they might like to change formats after the first day of classes, encourage them to try the software immediately. Students in a computer-mediated section may have a wide range of computer experience levels, but even those students who have never previously used a computer may excel in this class after learning how to use the computer and software.

Make sure that any changes needed to lower level courses are done before the last day to change developmental courses, which are not the same for college-credit add/drop. Check with the administrative assistant at your campus for specific dates.

**Homework:** Students learn the material by doing homework. They are more likely to do the homework if it is incorporated into the grading scheme in some way. Suggested homework assignments are provided.

**Final Exam Review:** Because the departmental final exam is comprehensive rather than focused on the last material covered, distribute the final exam review at least a couple of weeks before the end of the semester to give the students time to practice the material from the earlier chapters. The final exam review may be found online at [http://www.austincc.edu/mthdept5/Revtests/indexr.htm](http://www.austincc.edu/mthdept5/Revtests/indexr.htm) or obtained from a campus administrative assistant.

**Use of Notes on Exams and the Departmental Final** The MATD 0390 committee has decided that no notes should be used and no formulas should be given on the departmental final. The practice of giving formulas for any exam is discouraged. Also, the final exam should be given as written with the possible exception of including a few extra problems or making any needed corrections, which should be reported to the chairs of the committee so that all instructors may be notified.

**Formulas** Students are expected to know the following formulas from memory by the end of the course:
- Sum of the angles in a triangle
- Pythagorean Theorem
- Area and perimeter of triangles, rectangles, and squares
- All formulas for linear equations (slope formula, slope-intercept and point-slope forms)
- The quadratic formula
- Distance between two points
- Midpoint
- Distance = Rate × Time
- The standard form of the equation of a circle

**Withdrawing Students:** When you need to withdraw a student, fill out the slip and process it. Give a copy of the student's information sheet to the campus-based representative designated to handle developmental math at your campus. See material in the front part of the *Math Manual* for more information.
2006 - 2007
Additional Notes for Instructors for Non-Computer-Mediated Sections
Bittinger 7th Edition text


Optional Supplements:
  Student’s Solutions Manual ISBN 0-321-27822-4
  Instructor’s Solutions Manual ISBN 0-321-27815-1
  Videotapes ISBN 0-321-27819-X (The videotapes are available at each campus’s LRS.)

MyMathLab, as described below, is a supplement to the Bittinger text and is available online at no cost to students who purchase a new text. Students who purchase used texts may buy access to the programs from Addison Wesley for about $39.95 from www.mymathlab.com.

MyMathLab is an interactive online course that accompanies the textbook. It contains an online version of the book as well as multimedia learning aids (such as videos and animations) for selected examples and exercises in the text. Students can take tests in MyMathLab that generate a personalized study plan with links to practice exercises for the topics that need more study. Visit www.mymathlab.com for more information.

Instructors can use MyMathLab to assign online homework and tests, track students' results, and create an online community using a variety of course-management tools. Visit www.mymathlab.com for more information. If you choose to set up your own course, you’ll need to give students that unique course number in MyMathLab and tell them to use it instead of the generic ACC 0390 course whose access number is given in the standard student handout in this Manual.

MathXL® Tutorials on CD provides unlimited (algorithmically generated) practice exercises correlated to the textbook.

Addison Wesley has a tutoring center that is available by phone for students using any of their texts. Information about the service can be found at www.aw-bc.com/tutorcenter/. Call toll-free 1.888.777.0463. Hours of operation are Sun-Thur: 5 PM - 12 AM Eastern. Fax questions to 1.877.262.9774 and eMail questions to tutor@aw.com.

The InterAct Math® Tutorial Web site, which can be found at www.interactmath.com, generates algorithmically generated practice exercises that correlate directly to the exercises in the text.

Problem Sets: The main content of the course is covered in the exercise sets and your test problems should be taken from these types of problems. In addition, most sections have “Concept Reinforcement,” “Synthesis,” “Technology Connection” (appropriate for graphing calculator use),
“Writing Exercises,” “Collaborative Corners,” “Skill Maintenance,” and "Cumulative Review” exercises. You are encouraged to use various problems from the graphing calculator parts, the “Synthesis”, and the “Collaborative Corners” appropriately to enrich and enliven the class. Read the discussion of these in the Preface of the instructor’s text. Perhaps you will want to have students do some in class from time to time.

If you choose to occasionally include some exercises that require Technology or Synthesis in the homework, that is fine, but be sure your course is consistent with departmental guidelines. For instance, requiring students to do graphing calculator problems more than occasionally in the homework would, in reality, be requiring them to buy a graphing calculator, which is not acceptable. Also, requiring students to regularly do homework problems from the "Synthesis" portion of the exercises that require complex algebraic manipulation would result in a course substantially more advanced than is intended. Encourage students to do the problems in those exercises sets, but do not test over these topics specifically.

Pay attention to which problems have answers in the back of the student edition of the text, and make sure that you provide answers in class to those you assign for which the students cannot check their answers. Notice that the answers to both the odd- and even-numbered Chapter Review, Chapter Test, and Cumulative Review problems are in the students' books.

Chapter-by-Chapter Comments: Lecture Classes Using the Bittinger Text

Overall: In adopting the separate Bittinger texts for MATD 0370 and MATD 0390, the developmental committee wanted to begin the semester with more review than was done with the Angel text. Sufficient review at the beginning of the semester in MATD 0390 is necessary but students should show mastery of topics covered in MATD 0370 at the beginning of the semester, as demonstrated on the MATD 0390 Pretest. The Pretest is available from the Administrative Assistant at each campus but should be kept secure by each instructor.

Chapter 1: Algebra and Problem Solving

This chapter should be review but particular attention should be paid to reviewing problem solving techniques, formulas, models and geometry, and the laws of exponents. The entire chapter should be covered within the first two weeks of the semester.

1.1 Basic concepts of expression and equation, English-to-algebra translations, order of operations, sets of numbers are introduced.

1.2 Absolute value, inequalities (one variable), and operations and properties of real numbers are discussed.

1.3 Solving equations and combining like terms are reviewed. The “Connecting the Concepts” feature in this section discusses the distinction between equivalent expression and equivalent equations, which is often confusing for students. Stress that the properties of equality may only be used when solving an equation and do not apply to an expression. The term linear equation is introduced in this section along with identities, contradictions, and conditional equations.

1.4 Problem Solving is difficult for most students. This section outlines a five-step strategy for solving problems. The problems in this section are usually easy and should be used to build confidence in students’ abilities to achieve solutions.

1.5 In addition to the formulas listed in the section, there is a more complete list of geometric formulas on the inside of the back cover of the text and a list of other types of formulas inside the front cover. Each instructor should communicate with students which formulas should be memorized and which will be provided on exams.

1.6 Properties of exponents are important enough to review thoroughly because many students either never learned them well or have forgotten them.
Chapter 2: Graphs, Functions, and Linear Equations Although many of the concepts in this chapter are covered in MATD 0370, all of the function-related terminology and notation is new and all of the chapter’s content is critical for future work and should be covered in detail.

2.1 Students should be familiar with the coordinate plane but many will struggle with graphs that are created by plotting points. Encourage them to select enough values to ensure they have a reasonable idea of the shape of the graph and then extend the graph to imply other values.

2.2 Give examples of functions and non-functions using tables of values, correspondences, graphs, and formulas. The terms input and output are used in the text and in future courses, and function notation is used throughout the text. Relate domain values to all possible input values and range values to all possible output values. Discuss using function notation \( f(x) \) rather than the variable \( y \) and emphasize applications having students identify the input and output quantities.

2.3 The importance of slope and the slope-intercept form of linear functions cannot be overstated. Emphasize that the \( y \)-intercept is a good place to start a graph and that slope tells how to move from one point on the graph to another. Stress that slope is the rate-of-change of the output per unit change in input. It is often helpful to show students that a slope of \( \frac{2}{3} \) implies that \( y \) increases 2 every time \( x \) increases 3, which is equivalent to \( y \) increases \( \frac{2}{3} \) every time \( x \) increases by 1. That is, \( \frac{2}{3} \) is equivalent to \( \frac{2}{3} \cdot \frac{1}{1} \). Stress applications.

2.4 Horizontal and vertical lines often confuse students. Point out that if an equation is \( y = 4 \), then the \( y \)-value of every point on the graph is 4, and if an equation is \( x = -2 \) then the \( x \)-value of every point on the graph is \( -2 \). Discuss some equations that are not written in slope-intercepts form where finding both the \( x \)- and \( y \)-intercepts is a more efficient method of creating the graphs.

2.5 The point-slope form of a line is used extensively to write the equation of a line given two points or given a point other than the \( y \)-intercept and the slope. Discuss how it is possible for them to write linear equations from data they see in the news, but that they should have some indication that the relationship between two quantities is linear before writing a linear equation to model the data. The slopes of parallel and perpendicular lines are also presented.

2.6 The algebra of functions is usually easy for students once they realize that the notation indicates how to form a new function from given functions. Explain that when two functions are combined, the resulting function may have a different domain than either of the contributing functions. Stress that division by zero is never allowed and that any value that makes a denominator zero is not in the domain. That is, start with the set of real numbers and discard any values that result in division by zero and possibly other values that the context of a problem indicates. For example, when finding lengths, distances, area, etc., the only allowable outputs are non-negative. Any value that produces a negative result is not in the domain.

Chapter 3: [LIMITED] Systems of Linear Equations and Problem Solving MATD 0390 only covers systems of equations in two variables, which is presented in the first three sections of Chapter 3. The techniques for solving systems of equations is review and easy for students but the application problems usually cause difficulties.

3.1 This section begins by discussing how to translate problems into equations and then discusses identifying solutions graphically.

3.2 The substitution and elimination methods for solving systems are review topics but students should be aware of the strengths and weaknesses of each. The summary presented under the heading “Comparing Methods” and shown in “Connecting the Concepts” at the end of the section outline each method.

3.3 The application problems presented include total-value and mixture problems and motion problems. Students often have trouble writing the equations for these problems and ample time and practice should be given here.
3.8 [OPTIONAL] Business and Economic Applications are discussed in this section. If time permits you may want to include some of these problems.

Chapter 4: Inequalities and Problem Solving

4.1 Students will have seen inequalities in MATD 0370 and the material on linear inequalities should be fairly easy. Point out that the notation for an open interval, \((a, b)\), and the notation used to represent a point, \((a, b)\), are the same but the difference is usually clear in context. Again, emphasize applications.

4.2 Students often confuse “and” statements and “or” statements. Point out that there are no numbers that are greater than 4 and less than –2 and that an extended inequality of the form \(a < x < b\) represents all real numbers between \(a\) and \(b\). Stress that \(a\) must be less than \(b\) in such inequalities. Also note that “and” statements mean that both pieces of the statement must be true while “or” statements mean that at least one piece must be true. Basically, “and” statements involve solutions common to both conditions and “or” statements involve the collection of solutions of each condition.

4.3 [LIMITED] This section deals with absolute value equations and inequalities. Limit the solution of absolute value inequalities to those like \(|x| > k\) or \(|x| < k\). Stress that most absolute value equations have two solutions and that most absolute value inequalities have interval solutions. Also note that absolute value is a measure of distance to the origin.

4.4 Inequalities in two variables are new to students but fairly easy for them. Mention that there is nothing special about the fact that the boundaries shown in this section are always straight lines. Tell them that the same principles apply for graphing all inequalities, which include boundaries that are not lines.

Chapter 5: Polynomials and Polynomial Functions

Polynomials should be review for students and the first part of this chapter should be easy. Although students who completed Elementary Algebra from the Bittinger Elementary Algebra text the previous semester will have covered factoring, most students at this level need multiple exposures to factoring, particularly the more advanced topics.

5.1 Many students need review on writing the opposite of an expression. Stress that when subtracting polynomials, they are adding the opposite of the subtrahend (the second expression) and they should write the subtraction problem as the addition of the opposite of the entire subtrahend with the original minuend (the first expression).

5.2 Multiplying polynomials and using the distributive property should be review and easy. In prior semesters the squares of binomials were not stressed as a special case but students will be able to complete other techniques if they are familiar with the squares of binomials. Emphasize that \((a \pm b)^2\) is not \(a^2 \pm b^2\).

5.3 Students often do not completely factor an expression, so discuss reviewing each of their factors to make sure that the expression cannot be factored further.

5.4 Point out that trial-and-error is more efficient when the First and Last coefficients are prime numbers and that factor-by-grouping can be effectively used to determine when an expression cannot be factored over the set of real numbers.

5.5 Practice, practice, practice factoring, especially the difference of two perfect squares.

5.6 The material on factoring the sum and difference of cubes will be new to most students, and even if they have seen it before, they will probably have forgotten it. Students should memorize the factorization of the sum or difference of two cubes. Point out that the quadratic factor, \(x^2 \mp xy + y^2\), cannot be factored over the set of real numbers.

5.7 Students typically find this section difficult, whether they have seen the material before or not, because the problems require them to choose among different techniques. Begin the section with
a review of each of the methods already learned: factoring out a monomial, factoring by grouping, factoring trinomials, recognizing and factoring perfect square trinomials, factoring difference of two squares, and the sum and difference of two cubes. Emphasize the general procedure for factoring. Some teachers find it useful to have the students look through several of the problems and verbally identify how they would start.

5.8 Students have solved quadratic equation by factoring in MATD 0370, but a good review of the Principle of Zero Products is usually needed to explain why a quadratic equation must be set equal to zero before finding the solutions by setting each factor equal zero. The relationship between the solutions of a quadratic equation and the points of intersection of the graph of the quadratic function and a horizontal line was not in previous texts used for this course but it is a good foundation concept for our College Algebra course. Stress applications.

Chapter 6: Rational Expressions, Equations, and Functions You cannot assume that the students have had prior exposure to the material in this chapter. In general, all the material on rational expressions is tedious and hard for students and it is easy for them to lose their motivation. Concentrating on applications (explaining why we're doing this) often helps with motivation. Also, it is important to point out that there are a number of different topics in the course and that some of the later ones will seem very different (and perhaps less tedious) than this topic. Start each section with a review of how the operations are performed on numerical fractions, then extend to monomials, and then to more complicated expressions.

6.1 Point out that each division problem results in a multiplication problem and that it is easier to simplify before multiplying rational expressions. Emphasize problems 3 - 6.

6.2 Adding and subtracting rational expressions is difficult for students. Show them that the procedure for finding the LCM and equivalent fractions is the same as for numbers.

6.3 Remind students that the rules for expression are different than the rules for equations. Equivalent expressions are obtained by adding 0 or by multiplying by 1. Emphasize that the two procedures (multiplying by an appropriate expression of 1 or rewriting the complex fraction as division) result is the same solutions.

6.4 Before beginning to solve rational equations, point out that we will be simplifying these problems to linear or quadratic equations and review the methods for solving those types. Suggest that they review these as needed.

6.5 Work problems and motion problems are difficult for many students. Allow enough time to cover each type.

6.8 Variation is no longer covered in MATD 0370 and it should be given sufficient coverage to ensure that students master the topic. Solving a formula for a variable is covered in MATD 0370 but the topic is covered in greater depth in this section.

Chapter 7: Exponents and Radicals This material is new to students and is difficult for them. Emphasize basic properties that apply to all roots, not just square roots. The level of abstraction is new and difficult for students and is an important part of the syllabus.

7.1 Emphasize that the principal square root is the nonnegative number whose square is the radicand. The principal square root is meant when a radical value is given. Point out the difference when they solve an equation of the form \( x^2 = a \) where they need both the positive and negative numbers that produce \( a \) when squared. Also, using the absolute value when taking a square root may seem strange to students. Give numerical examples, such as \( \sqrt{(-3)^2} = \sqrt{9} = 3 = | -3 | \) to illustrate this.

7.2 Review the laws of exponents before starting this section and indicate where students can find examples and practice problems. (Chapter 1)

7.3 Point out the difference between simplifying a radical and finding an approximation of its value.
7.4 Rationalizing denominators and numerators is usually difficult for students. Some teachers begin with an example whose denominator contains a cube root and explore what is needed to make the denominator a whole number.

7.5 Point out that adding and subtracting radical expression is like combining like terms.

7.6 [LIMITED] Cover only the problems that can be solved by raising both sides to a power one time and emphasize checking for extraneous roots. The problems include two radical term and require raising both sides to a power more than once are considered College Algebra topics. It is important that students be able to do applications problems whose equations contain radicals.

7.7 This section introduces solving radical equations with application that involve the Pythagorean Theorem as well as 45-45-90 and 30-60-90 triangles.

7.8 Complex numbers are often easier for students than the other material in this chapter. Emphasize that the rules for manipulating radical expressions in the previous sections mostly assumed that the radicand is a non-negative number. (Have the students look back at some of the rules and notice that.) The main rule for manipulating radicals whose radicand is negative is to factor and write one factor as \(i\) and then manipulate the other factor according to the rules learned earlier.

**Chapter 8: Quadratic Function and Equations** This material is new to many students and fairly difficult for most. Don't be tempted to cover any of the omitted sections. Any extra time should be used on some of the required sections.

8.1 Completing the square is a mystery to most students, especially to those who know that the quadratic formula can be used to solve any quadratic equation, but emphasize that the technique will be needed again in 8.7 and in 10.1. Finding the intercepts of a function is new to almost all students.

8.2 Point out that the quadratic formula may be used to solve any quadratic but that factoring is often faster with some problems. Have students find approximate solutions on a calculator. The discriminant is discussed in 8.4 but can be included in this section.

8.3 Allow ample time for the application problems.

8.4 This section is very short and may be covered when the quadratic formula is discussed (8.2).

8.5 [OMIT] Material in this section is considered College Algebra level material.

8.6 Students may find the graphs of quadratic functions difficult. Allow enough time to cover each form pointing out the characteristics that can be seen from the equation.

8.7 The text gives two methods for finding the vertex of a parabola: completing the square and the formula \(\left(\frac{-b}{2a}, f\left(\frac{-b}{2a}\right)\right)\). Many students find that the notation for finding the second coordinate of the vertex confusing. Emphasize that \(f\left(\frac{-b}{2a}\right)\) represents the output value when the input value is \(\frac{-b}{2a}\), that is the second coordinate of the vertex may be found by substituting \(\frac{-b}{2a}\) for the input variable into the original function.

8.8 [LIMITED] Emphasize that max/min values are output values and that they occur at the vertex of any quadratic. Omit the material that requires students to write the equation of a parabola given three points because it requires solving a \(3 \times 3\) system of equations.

**Chapter 9: Exponential Functions** [LIMITED] Only one section of Chapter 9 should be included in the course.

9.2 Cover only the material about graphing exponential functions by plotting points and the material about compound interest. Do not cover the material about equations with \(x\) and \(y\) interchanged unless time permits.
Chapter 10:  Distance, Midpoints, and Circles [LIMITED] Only one section of Chapter 10 should be included in the course.

10.1 [LIMITED]: Omit the material on parabolas. Focus on the distance and midpoint formulas and circles. It is important that students going on to college-level courses be familiar with them. Student will need to review completing the square but may see more reason for the procedure here than in previous sections.

Suggested Homework Assignments for Intermediate Algebra: Concepts and Applications 7th Ed. by Bittinger and Ellenbogen

<table>
<thead>
<tr>
<th>Section</th>
<th>Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>11, 13, 15, 17, 19, 21, 25, 29, 33, 37, 39, 45, 49, 51, 59, 61</td>
</tr>
<tr>
<td>1.2</td>
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<td>1.3</td>
<td>3, 7, 17, 21, 23, 31, 35, 43, 49, 59, 67, 74, 79, 81, 83, 95</td>
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<tr>
<td>1.4</td>
<td>1, 5, 7, 9, 11, 13, 16, 19, 25, 29 (solve all problems assigned), 41</td>
</tr>
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<td>2, 4, 6, 7, 9, 13, 17, 19, 21, 23, 25, 31, 35, 39, 43, 55, 49, 71</td>
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<td>1.6</td>
<td>1, 2, 5, 9, 21, 25, 27, 29, 31, 37, 43, 49, 55, 59, 61, 77, 83, 97, 99, 107, 123</td>
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<td>1, 3, 7, 9, 13, 16, 19, 23, 33, 35, 41, 45, 48, 49, 51, 57</td>
</tr>
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**Suggested Testing Scheme**

Test 1: Chapters. 1 – 3 (week 4)
Test 2: Chapters. 4 – 5 (week 7)
Test 3: Chapter. 6 – 7.6 (week 9 or beginning of week 10)
Test 4: Chapter. 7.7 – 8.4 (week 12 or 13)
Final Exam Comprehensive including 8.6–8.8, 9.2 and 10.1
Prerequisites for Calculus

There are two calculus sequences at ACC (and at most colleges) -- Business Calculus and Calculus. The prerequisite sequence is different for these. Depending on background, students may start the prerequisite sequence at different places.

- Intermediate Algebra (MATD 0390)
- College Algebra**(MATH 1314)
- *Trigonometry (MATH 1316)
- Precalculus (MATH 2412)
- Calculus I (MATH 2413)
- Calculus II (MATH 2414)
- Calculus III (MATH 2415)

- Intermediate Algebra (MATD 0390)
- Math for Bus & Eco (MATH 1324)
- College Algebra (MATH 1314)
- Business Calculus I (MATH 1425)
- Business Calculus II (MATH 1426)

Where to start: The only way that students may skip courses in a sequence is to begin higher in the sequence, based on current knowledge of material from high school courses.

1. A student who needs a review of high school Algebra II will start in Intermediate Algebra (or below.)
2. A student who completed high school Algebra II, but no higher, and whose assessment test score indicates that he/she remembers that algebra, will start in College Algebra or Math for Business & Economics. A substantially higher assessment test score enables the student to start in Trigonometry.
3. A student who completed some precalculus, elementary analysis, or trigonometry in high school, and whose assessment test score indicates that he/she remembers algebra, is eligible to start higher in the sequence than College Algebra. Check the catalog or the math web page.***

* The material in the Trigonometry course requires that students are quite adept with the skills from high school Algebra II (Intermediate Algebra). Some students will achieve that level of skill in the College Algebra course if their placement score is high enough, while others need an additional semester of work on algebra that is done in two courses, Intermediate Algebra and College Algebra.

** Some students who are very successful in College Algebra are tempted to skip either Trigonometry or Precalculus and enroll in Calculus I. That is not acceptable. Trigonometry topics are essential to success in Calculus, and while it is true that the topic list for Precalculus has only a few additions from the topic list for College Algebra, the level of sophistication of the presentation and the problems on all topics is greater in Precalculus. That increased sophistication is necessary for an adequate background for the Calculus sequence. ***

Notes about the Business sequence: Texas State University requires Math for Business and Economics and Business Calculus I. Students who will attend the UT College of Business must complete the entire Business Calculus sequence before transferring. For more information, including requirements for UT economics students, see http://www.austincc.edu/mthdept2/notes/1425.html

*** For additional information, including prerequisite review sheets for most courses, see http://www.austincc.edu/math/
Intermediate Algebra

Campus _____ Room ________
Instructor: __________________________
Phone: (512) 223-_______ ext ________
Email address: ________________________

MATD 0390 Section _____ Synonym _______
Meets _______________________________  
Office: ______________________________
Office Hours: ________________________

Conferences outside office hours may be arranged by ____________________________


- You can access the chapters from the textbook covered in the first few days online at http://www.austincc.edu/mthdept2/text/ password acc0390 before you buy your text.

Optional: Shrink-Wrapped Bundle ISBN 0321371534, with Text and My Math Lab software access

MyMathLab is an optional interactive online course that accompanies the text. You may purchase access to MyMathLab online from AddisonWesley for $44.95 at: www.mymathlab.com/buying.html

MyMathLab includes:
- Online access to all pages of the textbook
- Multimedia learning aids (videos & animations) for select examples and exercises in the text
- Practice tests and quizzes linked to sections of the textbook
- Personalized study guide based on performance on practice tests and quizzes

Visit www.mymathlab.com for more information. To use MyMathLab, you'll need:
- Course ID*: ID acc16946
- Student access number: provided with purchase of MyMathLab access.

* If your instructor has set up a different course ID for your class, he or she will let you know. If so, use the course ID provided by your instructor.

Supplemental Required Materials: Scientific calculator

Course Objectives: Refer to http://www.austinec.edu/mthdept2/tfcourses/obj0390.htm

Prerequisite: C or better in Elementary Algebra, MATD 0370, or its equivalent knowledge, or a passing score on the MATD 0390 placement test.

**Additional information about ACC's mathematics curriculum and faculty is available on the Internet at http://www.austinec.edu/math/.

COURSE DESCRIPTION
MATD 0390 INTERMEDIATE ALGEBRA (3-4-0). A course designed to develop the skills and understanding contained in the second year of secondary school algebra. Topics include review of properties of real numbers, functions, algebra of functions, inequalities, polynomials and factoring, rational expressions and equations, radical expressions and equations, quadratic functions and their graphs, solving quadratic equations, and exponential functions. The same course is sometimes offered in a one hour (0190) and two hour (0290) format.

INSTRUCTIONAL METHODOLOGY
This course is taught in a classroom as a lecture/discussion course.
COURSE RATIONALE
This course is designed to prepare students for various college-level science and mathematics courses. After succeeding in this course, students may enroll in a number of courses in science, mathematics and various technical areas. These include General College Physics, General Chemistry, Magnetism and DC Circuits, AC Circuits, Manufacturing Materials and Processes, Math for Business and Economics, and College Algebra.

Attendance is required in this course. Students who miss more than 4 classes may be withdrawn. You are responsible for the material covered and any assignments that are due for the class period you miss. See also the Texas Success Initiative (TSI) Warning below.

TSI Warning: If you are relying on this course to meet a requirement that you be in mandatory remediation in mathematics this semester*, then:
 i) if you are not "continually in attendance" in this course, you should be withdrawn from the course by your instructor,
 ii) if you withdraw yourself from this course or are withdrawn by your instructor, you should be automatically withdrawn from all of your other college courses if this is the only TSI-mandated course you are taking.

*If you are unsure whether or not this warning applies to you, see an ACC advisor immediately.

Withdrawal policy: It is the student’s responsibility to initiate all withdrawals in this course. The instructor may withdraw students for excessive absences (4) but makes no commitment to do this for the student. After the withdrawal date, neither the student nor the instructor may initiate a withdrawal. The last day to withdraw from a course this semester is ________________.

Reinstatement policy: Students who withdraw or are withdrawn generally will not be reinstated unless they have completed all course work, projects, and tests necessary to place them at the same level of course completion as the rest of the class. After the last day to withdraw, neither the instructor nor the student may initiate reinstatement into the course.

Missed Exam Policy: [to be completed by each instructor]
Late Work Policy: [to be completed by each instructor]
Class Participation Expectations: [to be completed by each instructor]
Grading Policy: [to be completed by each instructor]

Incomplete grades (I) are given only in very rare circumstances. Generally, to qualify for an "I", a student must have taken all exams and assignments, have a passing grade, and have a personal situation occur that prevents course completion after the last day to withdraw.

In Progress grades (IP) are also rarely given. In order to earn an "IP" grade the student must remain in the course, be making progress in the material, not have excessive absences, and not be meeting the standards set to earn the grade of C or better in the course. Students who are given an IP grade must register and pay tuition for the same course again to receive credit. Students who make a grade of IP should not go on to the next course.

Student Discipline Policy Classroom behavior should support and enhance learning. Behavior that disrupts the learning process will be dealt with appropriately, which may include having the student leave class for the rest of that day. In serious cases, disruptive behavior may lead to a student being withdrawn from the class. ACC’s policy on student discipline can be found in the Student Handbook under Policy and Procedures
http://www.austincc.edu/handbook
Course-Specific Support Services

- **Learning Lab:** ACC main campuses have Learning Labs that offer free tutoring (first-come first-serve) in mathematics courses. The locations, contact information, and hours of availability of the Learning Labs are available from [http://www2.austinec.edu/tutor](http://www2.austinec.edu/tutor). Software and videotapes to support this particular text are available in the Learning Labs. Students who need regular tutoring are encouraged to use the Learning Labs before they get very far behind.

- **Software:** See description of MyMathLab under “Optional Materials” in this handout.

- **Addison Wesley:** Has a tutoring center that is available by phone for students using any of their texts. Information about the service can be found at [www.aw-bc.com/tutorcenter/](http://www.aw-bc.com/tutorcenter/). Call toll-free 1.888.777.0463. Hours of operation are Sun-Thur: 5 PM - 12 AM Eastern.
  Fax questions to 1.877.262.9774 and email questions to tutor@aw.com

- **Videotapes:** These are available for viewing in the LRS and are recommended for students who miss class.

**Testing Center Policy** Your class may have some tests in the Testing Center. Refer to [http://www.austinec.edu/testctr/](http://www.austinec.edu/testctr/) for additional information about the testing center’s hours and identification requirements. Your instructor may add personal policies on the use of the testing center.

**Student Services**

The web address for student services is [http://www.austinec.edu/rss/index.htm](http://www.austinec.edu/rss/index.htm)

The ACC student handbook can be found at [http://www.austinec.edu/handbook](http://www.austinec.edu/handbook)

**Instructional Services**

Information about locations of Instructional Services at each campus can be found by going to [http://www.austinec.edu/faculty/newsemester/](http://www.austinec.edu/faculty/newsemester/) and then clicking on “Campus Based Student Support Overview”.

### Suggested Course Schedules

*Schedule changes may occur during the semester, as announced in class.*

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<th>16-week Sections</th>
<th>11-week Sections</th>
<th>5 1/2 -week Sections</th>
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<td>Review &amp; Final</td>
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The following college policies must be included in each instructor’s first-day handout materials. The wording for each policy can be found in the front part of this manual.

1. Statement of Students with Disabilities [“as is” wording]
2. Statement on Scholastic Dishonesty [“as is” wording]
3. Penalty for Scholastic Dishonesty [recommended wording]
4. Statement of Prerequisite Requirements [“as is” wording]
5. Statement on Academic Freedom/Freedom of Expression [recommended wording]