CENTRAL TEXAS COLLEGE  
SYLLABUS FOR DSMA 0307  
INTERMEDIATE ALGEBRA  

Semester Hours Credit:  3

(This course is equivalent to DSMA 0303. This course is offered without the additional lab time.)

INSTRUCTOR: ______________________________

OFFICE HOURS: ______________________________

I. INTRODUCTION

Intermediate Algebra requires an understanding of the topics taught in DSMA 0306. This course teaches such topics as rational expressions, rational exponents and radicals, exponential and logarithmic equations, complex numbers, nonlinear inequalities, systems of nonlinear equations, quadratic equations, and functions and their graphs. This course will assist the student in developing the critical-thinking and problem-solving skills necessary for college level mathematics courses.

This course is required for students who have not achieved a passing score on the TSI Assessment. Successful completion of this course fulfills the prerequisites for college-level mathematics courses. The prerequisite for this course is DSMA 0306 or an appropriate placement test score.

II. LEARNING OUTCOMES

Upon successful completion of this course, Intermediate Algebra, the student will be able to:

A. Perform the basic operations on rational expressions and transfer this knowledge to the solution of application problems and equations. (F2, F7, F8, F9, F10, F11, F12)
B. Perform the basic operations on radical expressions and transfer this knowledge to the solution of application problems and equations. (F2, F7, F8, F9, F10, F11, F12)
C. Identify, graph, and solve quadratic equations by various methods and transfer this knowledge to the solution of application problems. (F2, F7, F8, F9, F10, F11, F12)
D. Solve and graph quadratic inequalities. (F2, F7, F8, F9, F10, F11, F12)
E. Demonstrate knowledge of functions and relations including their graphs, composite and inverse functions. (F2, F7, F8, F9, F10, F11, F12)
III. INSTRUCTIONAL MATERIALS/RESOURCES

To assist in this course, a variety of materials both in and out of the classroom will be required and used. The instructional materials identified for this course are viewable through:

www.ctcd.edu/books

Students will be allowed to use the basic calculator: Casio fx-115 ES

IV. COURSE REQUIREMENTS

A. Assignments will be made daily, and each assignment must be completed by the next class session. Assignments may be collected and examined at any time, and the instructor may require students to keep a notebook of completed assignments.

B. Completion of all assignments is required for a student to be eligible to take the final examination and to achieve a passing grade in this course.

V. EXAMINATIONS AND ASSIGNMENTS

CHALLENGE EXAMS

Mathematics students may be eligible, during the first week of the semester, to challenge the classes in which they are enrolled. Students must discuss the challenge procedures with their instructors to determine eligibility. If eligible to take the exam, a student will receive a signed challenge exam request form from the instructor. The challenge exam must be taken during the first week of classes.

A. Periodic examinations will be given during the course in order to evaluate a student's progress. A comprehensive mid-term and a comprehensive final will be given.

Failure to take the final examination for the course will result in a grade of zero (0) to be posted for that examination. Students may not "retake" any exam. No "early" finals, take-home or open-book examinations will be administered. No examination grades will be dropped.

B. If you miss an exam, and have an excused absence, your instructor will arrange a make-up at his/her discretion. Said make-up may involve counting the next exam as a 200 point exam.

If you miss an exam, and do not have an excused absence then a make-up exam will be granted only at the discretion of the instructor. The make-up exam, if granted, will be given by appointment only.
C. If the student is absent from class, it is his or her responsibility to contact his or her classmate/instructor to determine missed instruction. Each student must make appropriate arrangements to acquire assignments, announcements, lecture notes, and other pertinent information missed. Material on each class topic is available on the CD included with the text.

D. Class exams will be returned to students within three class periods after the test is administered.

VI. SEMESTER GRADE COMPUTATIONS

To receive a passing grade of “A,” “B,” or “C” in this course, each student must complete all requirements and assignments, and earn a weighted average of 70% or above. The semester average is derived from the periodic unit examinations, the homework, the midterm examination, and the comprehensive final examination. The periodic/unit examinations will determine 35%, the homework assignments 15%, the midterm 20%, and the comprehensive final will determine 30% of the final average.

Final grades will follow the grade designation for developmental courses below:

- “A” – Weighted average of 90 – 100%
- “B” - Weighted average of 80 – 90%
- “C” - Weighted average of 70 – 79%
- “D” – Weighted average of 60 – 69%
- “F” – Weighted average of 0 – 59%
- “W” - Withdrawal from course (initiated by student)

Students may receive their grades through:

The CTC WebAdvisor (Online) System. Instructions for using the WebAdvisor (online) Registration/Grades by computer are listed in the schedule bulletin.

Grades will not be posted.

VII. NOTES AND ADDITIONAL INSTRUCTIONS FROM THE INSTRUCTOR

A. Withdrawal from Course: It is the student's responsibility to officially withdraw from a class if circumstances prevent attendance. Any student who desires to, or must, officially withdraw from a course after the first scheduled class meeting must file an Application for Withdrawal or Application for Refund. The withdrawal form must be signed by the student.

An application for Withdrawal will be accepted at any time prior to Friday of the 12th week of classes during the 16 week fall and spring semesters. The deadline for
sessions of other lengths is as follows:

<table>
<thead>
<tr>
<th>Length</th>
<th>Date of Withdrawal</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 week</td>
<td>Friday of the 9th week</td>
</tr>
<tr>
<td>10 week</td>
<td>Friday of the 7th week</td>
</tr>
<tr>
<td>8 week</td>
<td>Friday of the 6th week</td>
</tr>
<tr>
<td>6 week</td>
<td>Friday of the 4th week</td>
</tr>
<tr>
<td>5 week</td>
<td>Friday of the 3rd week</td>
</tr>
</tbody>
</table>

The equivalent date (75% of the semester) will be used for session of other lengths. The specific last day to withdraw is published each semester in the Schedule Bulletin.

Students who officially withdraw will be awarded the grade of "W" provided their academic performance is satisfactory at the time of official withdrawal. Students must file a withdrawal application with the college before they may be considered for withdrawal.

Before withdrawing from any developmental course, the student should seek the advice of Guidance and Counseling so that the student does not initiate an action that would inadvertently have negative repercussions on his/her enrollment or Financial Aid.

B. **Cellular Phones and Pagers:** Cellular phones and pagers must be turned off and put away while the student is in the classroom.

C. **American's with Disabilities Act (ADA):** Disability Support Services provides services to students who have appropriate documentation of a disability. Students requiring accommodations for class are responsible for contacting the Office of Disability Support Services (DSS) located on the central campus. This service is available to all students, regardless of location. Review the website at [www.cted.edu/disability-support](http://www.cted.edu/disability-support) for further information. Reasonable accommodations will be given in accordance with the federal and state laws through the DSS office.

D. **Civility:** Individuals are expected to be cognizant of what a constructive educational experience is and respectful of those participating in a learning environment. Failure to do so can result in disciplinary action up to and including expulsion.

E. **Office Hours:** Full-time instructors post their office hours outside their office doors. Part-time instructors may be available by appointment. Please feel free to see your instructor should you find yourself having difficulty with this course.

**VIII. COURSE OUTLINE**

A. **Unit One:** Chapter Thirteen **Factoring Polynomials**

1. **Unit Objectives:** Upon successful completion of this unit the student will
be able to do the following:

a) Identify the Greatest Common Factor of a List of Integers
b) Identify the Greatest Common Factor of a List of Terms
c) Demonstrate ability to Factor Out the Greatest Common Factor from a Polynomial
d) Demonstrate ability to Factor a Polynomial by Grouping
e) Demonstrate ability to Factor trinomials of the form \( x^2 + bx + c \)
f) Demonstrate ability to Factor trinomials of the form \( ax^2 + bx + c \)
g) Demonstrate ability to Factor trinomials of the form \( ax^2 + bx + c \)
h) Demonstrate ability to Factor trinomials of the form \( ax^2 + bx + c \)
   where \( a \neq 1 \)
i) Demonstrate ability to Factor Out a GCF Before Factoring a Trinomial of the form \( ax^2 + bx + c \)
j) Demonstrate ability to Factor a perfect square trinomial
k) Use the Grouping Method to Factor Trinomials of the Form \( ax^2 + bx + c \)
l) Demonstrate ability to Factor the difference of two squares
m) Demonstrate ability to Factor the sum or difference of two cubes
n) Solve Quadratic Equations by Factoring
o) Solve Equations with Degree Greater than 2 by Factoring
p) Identify the x-intercepts of the Graph of a Quadratic Equation in Two Variables
q) Solve Problems That Can Be Modeled By Quadratic Equations.

2. **Learning Activities:**
   a. Classroom lecture/discussion (F5, F6, F7, F8)
   b. Reading/homework assignments (F1, F2, F7, F8, F9, F10, F11, F12)
   c. Computer Lab/Computer Tutor (F2, F7, F8, F9, F10, F11, F12)

3. **Unit Outline:**
   a. Section 13.1 The Greatest Common Factor and Factoring By Grouping
   b. Section 13.2 Factoring Trinomials of the Form \( x^2 + bx + c \)
   c. Section 13.3 Factoring Trinomials of the Form \( ax^2 + bx + c \) and Perfect Square Trinomials
   d. Section 13.4 Factoring Trinomials of the Form \( ax^2 + bx + c \) by Grouping
   e. Section 13.5 Factoring Binomials
   f. Section 13.6 Solving Quadratic Equations by Factoring
   g. Section 13.7 Quadratic Equations and Problem Solving

B. **Unit Two: Chapter Fourteen Rational Expressions**

1. **Unit Objectives:** Upon successful completion of this unit the student will be able to do the following:
a. Identify the domain of a rational expression
b. Write and simplify rational expressions in lowest terms
c. Write equivalent rational expressions of the form \( \frac{a}{b} = \frac{-a}{-b} = \frac{a}{-b} \)
d. Solve application problems using Rational functions.
e. Demonstrate ability to multiply rational expressions
f. Demonstrate ability to divide rational expressions
g. Convert between Units of Measure
h. Demonstrate ability to add or subtract rational expressions with the same denominator
i. Identify the least common denominator of a list of rational expressions
j. Write a rational expression as an equivalent expression whose denominator it given
k. Demonstrate ability to add or subtract rational expressions with unlike denominators
l. Solve equations containing rational expressions
m. Solve equations containing rational expressions for a specified variable
n. Solve problems using proportions.
o. Solve problems about numbers
p. Solve problems about work
q. Solve problems about distance
r. Solve complex fractions by simplifying the numerator and denominator and then dividing.
s. Write complex fractions in simplified form by multiplying by a common denominator.
t. Write rational expressions using negative exponents.

2. Learning Activities:
a. Classroom lecture/discussion (F5, F6, F7, F8)
b. Reading/homework assignments (F1, F2, F7, F8, F9, F10, F11, F12)
c. Computer Lab/Computer Tutor (F2, F7, F8, F9, F10, F11, F12)

3. Unit Outline:
a. Section 14.1 Rational Functions and Simplifying Rational Expressions
b. Section 14.2 Multiplying and Dividing Rational Expressions
c. Section 14.3 Adding and Subtracting Rational Expressions with Common Denominators and Least Common Denominator
d. Section 14.4 Adding and Subtracting Rational Expressions with Unlike Denominators
e. Section 14.5 Solving Equations Containing Rational Expressions
f. Section 14.6 Problem Solving with Proportions and Rational Expressions.
g. Section 14.7 Simplifying Complex Fractions
C. **Unit Three:** Chapter Sixteen **Inequalities and Absolute Value**

1. **Unit Objectives:** Upon successful completion of this unit the student will be able to do the following:
   a. Identify the Intersection of Two Sets
   b. Solve Compound Inequalities Containing and.
   c. Identify the Union of Two Sets
   d. Solve Compound Inequalities Containing or.
   e. Solve Absolute Value Equations
   f. Solve Absolute Value Inequalities of the form $|x| < \alpha$
   g. Solve Absolute Value Inequalities of the form $|x| > \alpha$
   h. Construct the graph of a linear inequality in Two Variables
   i. Solve a system of linear inequalities.

2. **Learning Activities:**
   a. Classroom lecture/discussion (F5, F6, F7, F8)
   b. Reading/homework assignments (F1, F2, F7, F8, F9, F10, F11, F12)
   c. Computer Lab/Computer Tutor (F2, F7, F8, F9, F10, F11, F12)

3. **Unit Outline:**
   a. Section 16.1 Compound Inequalities
   b. Section 16.2 Absolute Value Equations
   c. Section 16.3 Absolute Values Inequalities
   d. Section 16.4 Graphing Linear Inequalities and Systems of Linear Inequalities

D. **Unit Four:** Chapter Seventeen **Rational Exponents, Radicals, and Complex Numbers**

1. **Unit Objectives:** Upon successful completion of this unit the student will be able to do the following:
   a. Calculate square roots
   b. Infer possible solutions to roots
   c. Calculate cube roots
   d. Calculate $n$th roots
   e. Calculate $\sqrt[n]{a}$ where $a$ is a real number
   f. Construct the graph of square and cube root functions
   g. Explain the meaning of $a^{1/n}$
   h. Explain the meaning of $a^{m/n}$
   i. Explain the meaning of $a^{-m/n}$
   j. Identify and implement rules for exponents to simplify expressions that contain rational exponents
   k. Manipulate rational exponents to simplify radical expressions
   l. Identify and implement the product rule for radicals
m. Identify and implement the quotient rule for radicals
n. Write radicals in simplified form
o. Calculate the distance and midpoint between two points.
p. Demonstrate ability to add or subtract radical expressions
q. Demonstrate ability to multiply radical expressions
r. Demonstrate ability to rationalize denominators
s. Demonstrate ability to rationalize denominators having two terms
t. Solve equations that contain radical expressions
u. Model problems by using the Pythagorean theorem.
v. Write square roots of negative numbers in the form bi
w. Demonstrate ability to add or subtract complex numbers
x. Demonstrate ability to multiply complex numbers
y. Demonstrate ability to divide complex numbers
z. Calculate i raised to powers

2. Learning Activities:
   a. Classroom lecture/discussion (F5, F6, F7, F8)
   b. Reading/homework assignments (F1, F2, F7, F8, F9, F10, F11, F12)
   c. Computer Lab/Computer Tutor (F2, F7, F8, F9, F10, F11, F12)

3. Unit Outline:
   a. Section 17.1 Radicals and Radical Functions
   b. Section 17.2 Rational Exponents
   c. Section 17.3 Simplifying Radical Expressions
   d. Section 17.4 Adding, Subtracting and Multiplying Radical Expressions
   e. Section 17.5 Rationalizing Denominators of Radical Expressions
      (Objectives 1 and 2)
   f. Section 17.6 Radical Equations and Problem Solving
   g. Section 17.7 Complex Numbers

E. Unit Five: Chapter Eighteen Quadratic Equations and Functions

1. Unit Objectives: Upon successful completion of this unit the student will be able to do the following:
   a. Solve quadratic equations using the square root.
   b. Solve quadratic equations by completing the square
   c. Solve problems by using quadratic equations.
   d. Solve quadratic equations by using the quadratic formula
   e. Identify the number and type of solutions of a quadratic equation by using the discriminant
   f. Solve problems modeled by quadratic equations
   g. Solve various equations that are quadratic in form
   h. Solve problems that lead to quadratic equations
i. Solve polynomial inequalities of degree 2 or greater
j. Solve inequalities that contain rational expressions with variables in the denominator
k. Construct the graph of quadratic functions of the form \( f(x) = x^2 + k \)
l. Construct the graph of quadratic functions of the form \( f(x) = (x - h)^2 \)
m. Construct the graph of quadratic functions of the form \( f(x) = (x - h)^2 + k \)
n. Construct the graph of quadratic functions of the form \( f(x) = ax^2 \)
o. Construct the graph of quadratic functions of the form \( f(x) = a(x - h)^2 + k \)
p. Write quadratic functions of the form \( y = a(x - h)^2 + k \)
q. Derive a formula for finding the vertex of a parabola
r. Calculate the minimum or maximum value of a quadratic function

2. Learning Activities:
a. Classroom lecture/discussion (F5, F6, F7, F8)
b. Reading/homework assignments (F1, F2, F7, F8, F9, F10, F11, F12)
c. Computer Lab/Computer Tutor (F2, F7, F8, F9, F10, F11, F12)

3. Unit Outline:
a. Section 18.1 Solving Quadratic Equations by Completing the Square
b. Section 18.2 Solving Quadratic Equations by the Quadratic Formula
c. Section 18.3 Solving Equations by Using Quadratic Methods
d. Section 18.4 Nonlinear Inequalities in One Variable
e. Section 18.5 Quadratic Functions and Their Graphs
f. Section 18.6 Further Graphing of Quadratic Functions