

**JEFFERSON COLLEGE**

**COURSE SYLLABUS**

**MTH128**

**INTERMEDIATE ALGEBRA**

3 Credit Hours

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## **MTH128: Intermediate Algebra**

### **I. CATALOG DESCRIPTION**

- A. Course pre-requisites/co-requisites: COMPASS Algebra score of at least 42 within the past two years, ACT Math score of 18 or higher within the past two years, or MTH002 (Beginning Algebra) with a grade of "C" or better, or MTH110 (Introductory Algebra) with a grade of "D", and reading proficiency
- B. 3 semester credit hours
- C. Intermediate Algebra continues the development of the algebraic skills introduced in Beginning Algebra. Students may not apply both MTH110 and MTH128 toward graduation. This course counts as an elective toward the Associate of Arts degree. (F, S, Su, 0)
- D. Intermediate Algebra (planned to phase out in future due to changes in math courses and co-requisites – HIT and Rad Tech will need to change the required course)  
Fulfills Mathematic Sciences for select AAS degrees (Applied Technology, Apprenticeship Training, Automotive Technology, Business Management, Child Care / Early Childhood Education, Computer Information Systems, Culinary Arts, Emergency Medical Technology, Health Information Technology, Heating, Refrigeration, and Air Conditioning Technology, Criminal Justice – Law Enforcement Academy, Physical Therapist Assistant, Radiologic Technology, Welding Technology) general education requirement, NOT part of MOTR CORE 42.  
Fulfills AAS – Health Information Technology degree requirement.  
Fulfills AAS – Radiologic Technology degree requirement.  
Elective course applies toward AA and AAT degree requirement.  
May not apply both MTH110 and MTH128 toward graduation.

II. EXPECTED LEARNING OUTCOMES/CORRESPONDING ASSESSMENT MEASURES

Note: Each of the following learning outcomes will be measured on at least one in-class exam, but instructors are encouraged to assess them with additional measures including homework, quizzes, and/or projects.

Expected Learning Outcomes	Assessment Measures
Demonstrate proficiency with skills taught in Beginning Algebra or Introductory Algebra	Class discussion/practice, homework, quizzes/tests
Use appropriate algebraic techniques to solve linear and absolute value equations and inequalities in one	Class discussion/practice, homework, quizzes/tests
Use appropriate algebraic techniques to find and graph equations of linear equations and inequalities, given various types of information	Class discussion/practice, homework, quizzes/tests
Use appropriate algebraic techniques to solve systems of equations in two variables, and to write and solve applied systems problems	Class discussion/practice, homework, quizzes/tests
Demonstrate an understanding of the concept of a function and function notation, by identifying domain and range, computing function values and graphing	Class discussion/practice, homework, quizzes/tests
Use appropriate algebraic techniques to perform operations on polynomials: add, subtract, multiply, and divide (including long and synthetic division); factoring	Class discussion/practice, homework, quizzes/tests
Use appropriate algebraic techniques to simplify rational expressions and complex rational expressions, perform operations with rational expressions, solve rational equations	Class discussion/practice, homework, quizzes/tests
Use appropriate algebraic techniques to simplify rational exponent expressions, and convert between rational exponent and radical forms	Class discussion/practice, homework, quizzes/tests

Use appropriate algebraic techniques to simplify and perform operations with radical expressions, including rationalizing denominators	Class discussion/practice, homework, quizzes/tests
Use appropriate algebraic techniques to perform operations with complex numbers	Class discussion/practice, homework, quizzes/tests

### III. COURSE OUTLINE

- A. Linear equations and inequalities
1. Solve first-degree equations with one unknown
  2. Solve literal equations and formulas
  3. Solve absolute value equations
  4. Use equations to solve word problems
  5. Solve linear inequalities
  6. Solve compound inequalities
  7. Solve absolute value inequalities
- B. Equations and inequalities in two variables and functions
1. Graph a linear equation
  2. Find the slope of a line
  3. Determine if two lines are parallel or perpendicular
  4. Use the slope-intercept form for the equation of a line
  5. Use the point-slope form for the equation of a line
  6. Determine the equation of a line given two points on the line
  7. Determine the equation of a line given the slope and y-intercept
  8. Determine the equation of a line given the slope and a point on the line
  9. Determine the equation of a line given a point on the line and the equation of a line that parallel or perpendicular to the line to be found
  10. Graph a linear inequality
  11. Determine the domain and range of a relation
  12. Determine if a relation is a function
  13. Evaluate a function using function notation
  14. Graph a function given an equation
  15. Graph a function given a table of values
- C. Systems of linear equations
1. Determine whether an ordered pair is a solution to a system of two equations in two unknowns
  2. Solve a system of two equations in two variables by the graphing method
  3. Solve a system of two equations in two variables by the substitution method
  4. Solve a system of two equations in two variables by the

elimination method

5. Identify systems of equations that have zero, one, or an infinite number of solutions
6. Solve an applied problem requiring the use of a system of two linear equations in two variables

D. Polynomials

1. Add, subtract, and multiply two or more polynomials
2. Divide a polynomial by a monomial
3. Use polynomial long division to divide a polynomial by a polynomial
4. Use synthetic division to divide a polynomial by a binomial
5. Factor out the greatest common factor from a polynomial
6. Factor a polynomial by the grouping method
7. Factor a trinomial
8. Factor a binomial that is the difference of two perfect squares
9. Factor a binomial that is the sum or difference of two perfect cubes
10. Combine the factoring techniques to completely factor any polynomial
11. Recognize polynomials that are prime
12. Solve a quadratic equation by factoring
13. Solve applied problems that involve a factorable quadratic equation

E. Rational expressions and equations

1. Simplify a radical expression
2. Multiply or divide two rational expressions
3. Find the LCD of two or more rational expressions
4. Add or subtract two or more rational expressions
5. Simplify complex rational expressions
6. Solve rational equations
7. Solve a rational formula for a specific variable
8. Solve ratio problems

F. Rational exponents and radicals

1. Simplify expressions with rational exponents
2. Evaluate  $d^{\frac{1}{n}}$  root radical expressions
3. Convert between rational exponent expressions and radical notation
4. Simplify radical expressions
5. Add or subtract radical expressions
6. Multiply radical expressions
7. Divide radical expressions
8. Rationalize the denominator of a radical expression
9. Solve radical equations
10. Simplify complex number expressions
11. Add or subtract complex numbers
12. Multiply or divide complex numbers
13. Evaluate complex numbers of the form  $i^k$

- G. Quadratic equations
  - 1. Solve quadratic equations by the square root property
  - 2. Solve quadratic equations by completing the square
  - 3. Solve quadratic equations using the Quadratic Formula
  - 4. Determine the nature of the roots of a quadratic equation by using the discriminant
  - 5. Write a quadratic equation given the solutions of the equation
  - 6. Solve an equation that is quadratic in form
  - 7. Solve a quadratic equation containing several variables
  - 8. Solve problems requiring use of the Pythagorean Theorem
  - 9. Solve applied problems requiring the use of a quadratic equation
  - 10. Find the vertex of a quadratic function
  - 11. Graph a quadratic function
  - 12. Use the distance formula (optional)
  - 13. Use the midpoint formula (optional)
  - 14. Use the standard form for the equation of a circle (optional)
  
- H. Additional properties of functions
  - 1. Evaluate a function using function notation
  - 2. Use function notation to solve applied problems

#### IV. METHODS OF INSTRUCTION

- A. Lecture
- B. Discussion
- C. MyMathLab interactive assignments
- D. Small group activities (optional)
- E. Lab-based activities (optional)

#### V. REQUIRED TEXTBOOK(S)

- A. Tobey, J. *Intermediate algebra* (Current Edition). Boston: Pearson.
- B. *MyMathLab - Standalone Access Card* (current edition). Boston: Pearson.

#### VI. REQUIRED MATERIALS

- A. Scientific calculator (optional - Symbolic manipulating calculators prohibited)

#### VII. SUPPLEMENTAL RESOURCES

- A. Available on-campus

1. Math Lab (Hillsboro, Arnold, and Online)
  2. Peer tutoring
- B. Available online within MyMathLab
1. Studyplan
  2. Section videos
  3. Pearson Tutor Services (30 minutes free, additional time at cost)

### VIII. METHODS OF EVALUATION

- A. Homework 10-20%  
Students will submit homework in MyMathLab but are expected to keep written solutions for all work submitted. Additional problems from the textbook may also be assigned.
- B. Classwork 0-20%  
Additional worksheets and projects may be assigned at the discretion of the instructor to reinforce various concepts.
- C. Quizzes 0-20%  
Both in-class and online quizzes may be used to evaluate mastery of concepts.
- D. Tests 30-60%  
There will be a minimum of three unit tests, each covering 1-2 chapters of material. These exams may be administered on paper or online.
- E. Comprehensive final examination 15-25%  
All students will be required to take a comprehensive final exam, the score of which must be included in the final course grade.

### IX. ADA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Technology Center 101; phone 636-481-3169).

### X. ACADEMIC HONESTY STATEMENT

All students are responsible for complying with campus policies as stated in the Student Handbook (see College website, <http://www.jeffco.edu>).

### XI. ATTENDANCE STATEMENT

Regular and punctual attendance is expected of all students. Any one of these four

options may result in the student being removed from the class and an administrative withdrawal being processed: (1) Student fails to begin class; (2) Student ceases participation for at least two consecutive weeks; (3) Student misses 15 percent or more of the coursework; and/or (4) Student misses 15 percent or more of the course as defined by the instructor. Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details.

## XII. OUTSIDE OF CLASS ACADEMICALLY RELATED ACTIVITIES

The U.S. Department of Education mandates that students be made aware of expectations regarding coursework to be completed outside the classroom. Students are expected to spend substantial time outside of class meetings engaging in academically related activities such as reading, studying, and completing assignments. Specifically, time spent on academically related activities outside of class combined with time spent in class meetings is expected to be a minimum of 37.5 hours over the duration of the term for each credit hour.