JEFFERSON COLLEGE

COURSE SYLLABUS

MTH 110

INTRODUCTORY ALGEBRA

3 Credit Hours

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MTH 110: Introductory Algebra

I. CATALOG DESCRIPTION

A. Course Pre-requisites / Co-requisites: COMPASS pre-algebra score of at least 33 within the past two years, ACT math score of 16 or higher within the past two years, or MTH001 with a grade of "B" or better, and reading proficiency

B. 3 semester credit hours

C. Introductory Algebra is designed for the student who has not necessarily had prior instruction in algebra, and is intended to prepare him or her for success in MTH 134, College Algebra. Topics covered include: simplifying and evaluating algebraic expressions including exponents and radicals; solving and graphing linear, quadratic, and absolute value equations; solving linear systems; and using function notation. Use of graphing technology is emphasized throughout. This course counts as an elective toward the Associate of Arts degree. Students may not apply both MTH 110 and MTH 128 toward graduation. Internet access and a graphing calculator is required. (F, S)

D. Introductory Algebra (planned to phase out in near future due to changes in math courses and co-requisites - HIT and PTA 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, Welding Technology) general education requirement, NOT part of MOTR CORE 42.
Fulfills AAS – Health Information Technology degree requirement.
Fulfills AAS – Physical Therapist Assistant 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

Expected Learning Outcomes	Assessment Measures
Simplify, evaluate, and convert algebraic expressions between standard forms (Linear, quadratic, polynomial, exponential and radical)	In-class exams as well as in-class and out-of-class assignments, and online quizzes
Solve and graph algebraic equations. (linear, quadratic, absolute value)	In-class exams as well as in-class and out-of-class assignments, and online quizzes
Add, subtract, multiply, and factor polynomial expressions	In-class exams as well as in-class and out-of-class assignments, and online quizzes

Use function notation and find domains of functions	In-class exams as well as in-class and out-of-class assignments, and online quizzes
Graph basic library functions, and functions resulting from a single transformation of a basic library function (linear, quadratic, cubic, square root, cube root, absolute value)	In-class exams as well as in-class and out-of-class assignments, and online quizzes
Use algebra to solve applied problems	In-class exams as well as in-class and out-of-class assignments, and online quizzes
Use technology appropriately to predict, verify, and approximate results	In-class exams as well as in-class and out-of-class assignments, and online quizzes

III. OUTLINE OF TOPICS

(Note: "TI" refers to the Texas Instruments TI-83 or 84 series graphing calculator)

A. Basic skills
1. Graph (x,y) points in the coordinate plane
2. Perform arithmetic operations on signed numbers
3. Apply the "order of operations" to evaluate simple expressions
4. Apply the "order of operations" to evaluate expressions including parentheses
5. Evaluate linear expressions for given input
6. Graph lines point by point
7. Graph lines by graphing intercepts
8. Enter functions into the TI's "y =" screen
9. Use the TI's table and trace features identify points on a graph
10. Adjust the viewing window in the TI to get an appropriate view of a graph

B. Linear equations
1. Solve basic linear equations
2. Solve linear equations requiring simplification
3. Solve linear equations containing fractions
4. Calculate the slope of a line given two points
5. Find the equation of a line given the slope and intercept
6. Translate linear equations from standard form to slope intercept form
7. Find the equation of a line given two points
8. Translate linear equations from point-slope form to slope intercept form
9. Solve applied problems involving linear relationships
10. Discuss the meaning of slope and intercept in applied problems
11. Solve equations by graphing in the TI
12. Convert decimals into a fraction form in the TI

C. Linear systems
1. Solve 2 by 2 systems of linear equations by elimination
2. Solve 2 by 2 systems of linear equations by substitution

3. Solve 2 by 2 systems of linear equations by graphing with the TI
4. Solve applied problems by using systems of equations

D. Linear inequalities
1. Graph inequalities
2. Use interval notation to express simple and compound inequalities
3. Solve simple linear inequalities
4. Solve compound linear Inequalities
5. Solve absolute value inequalities
6. Find zeros of functions using the TI

E. Exponents and roots
1. Evaluate exponential expressions
2. Apply basic rules of exponents to simplify expressions (multiply, divide, power to power, zero power)
3. Rewrite simple expressions containing negative exponents with positive exponents
4. Evaluate perfect square and cube roots
5. Evaluate fractions to integer powers
6. Evaluate rational roots (3/2, 5/2, 2/3) of numbers with integer results
7. Simplify roots of x to a power
8. Simplify non-perfect square roots
9. Simplify roots of negatives
10. Simplify expressions as might result from quadratic formula
11. Calculate roots in the TI
12. Check equivalency of numeric values using the decimal approximations in the TI
13. Enter fractions requiring parentheses into the TI

F. Polynomials
1. Identify the degree of a given polynomial in one variable
2. Accurately name polynomials (i.e. quadratic, trinomial)
3. Add and subtract polynomials
4. Multiply a polynomial by a monomial
5. Multiply two binomials
6. Multiply binomials resulting in difference of squares
7. Square binomials
8. Multiply a product of three binomials
9. Perform synthetic division

G. Factoring polynomials
1. Factor a monomial from a polynomial
2. Factor quadratic polynomials with a leading coefficient 1
3. Factor 4-term cubic polynomials by grouping
4. Factor higher degree polynomials having a power of x as a factor
5. Factor by difference of squares

6. Solve quadratic equations by factoring
7. Solve quadratic equations by quadratic formula
8. Check solutions using the TI
9. Find the vertex of a quadratic function by using -b/2a (integral coordinates only)
10. Find the intercepts of a quadratic by factoring (integral coordinates only)
11. Hand-Graph quadratics accurately (integral coordinates only)
12. Solve quadratic inequalities with the assistance of the TI
13. Graph polynomials using the TI and use zeros to predict factors
14. Find the vertex of a quadratic function by using the TI to calculate the max/min
15. Solve applied problems involving quadratics where the function is given

H. Functions
1. Identify a function (vs. a non-function relation) expressed as a table
2. Use the vertical line test to identify a function from its graph
3. Use function notation
4. Identify the domains of functions
5. Give the rule for a given function graph from the library of basic functions (identity, quadratic, cubic, square root, cube root, absolute value) and vice versa
6. Graph functions that are simple (only one) transformations of a library function
7. Give and simplify the result of algebraic operations (addition, subtraction, multiplication) on simple functions

IV. METHODS OF INSTRUCTION

A. Lecture

B. Class discussion

C. MyMathLab interactive assignments

D. In-class cooperative assignments

V. REQUIRED TEXTBOOK

(Paper copy is not required)

Tobey, Slater, Blair, & Crawford. *Beginning & Intermediate Algebra* (current edition). Boston: Pearson. (Paper copy is not required)

VI. REQUIRED MATERIALS

A. MyMathLab student access code

B. Writing supplies (pen/pencil, paper)

C. Texas Instruments graphing calculator (TI-83/84 series recommended. Symbolic manipulators are not permitted)

VII. SUPPLEMENTAL REFERENCES

A. Available on-campus
   1. Math Lab (Hillsboro, JCA)
   2. Peer tutoring

B. Available online within MyMath Lab
   1. Study Plan
   2. Section videos
   3. Pearson Tutor Services (30 minutes free, additional time at cost)

VIII. METHODS OF EVALUATION

A. Homework, 10%
Students will submit homework in MyMathLab and are expected to keep written solutions for all work submitted.

B. Classwork, 10%
Additional worksheets and projects will be assigned, to be completed both in and out of the classroom.

C. Quizzes, 10%
Online quizzes will be used to evaluate mastery of basic concepts.

D. Tests, 50%
There will be a minimum of three unit tests which may be administered on paper or online.

E. Comprehensive final examination, 20%
All students will be required to take a comprehensive final exam, the score of which must be included in the final course grade. Students must earn a score of at least 60% on the final exam in order to receive a grade of "C" or better for the course.

F. Grading Scale
90-100% = A
80-89% = B
70-79% = C
60-69% =D
Below 60% = F

IX. ADA AA 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.