

Coffeyville Community College

#MATH-102

COURSE SYLLABUS

FOR

INTERMEDIATE ALGEBRA

Marla Larimore

Instructor

COURSE NUMBER: MATH-102 **COURSE TITLE:** Intermediate Algebra

CREDIT HOURS: 3

INSTRUCTOR: Marla Larimore

OFFICE LOCATION: In the Library (east side) 251-7700, ext. 2086

OFFICE HOURS: As posted at the office

PREREQUISITE(S): A minimum score of 31 on the Algebra Test of the COMPASS, or 16 on the ACT test, or credit in Introductory Algebra with a grade of C or above.

REQUIRED TEXT AND MATERIALS: *Intermediate Algebra*, Tenth Edition, Lial/Hornsby/McGinnis

COURSE DESCRIPTION: This course is designed to survey the basic topics in algebra which will enable the student to enter a course in college algebra.

EXPECTED LEARNER OUTCOMES: Upon completion of this course, the student will be able to:

1. Add, subtract, multiply and divide signed numbers.
2. Solve equations and inequalities.
3. Add, subtract, multiply and divide polynomial expressions.
4. Factor polynomial expressions.
5. Simplify and solve rational expressions & equations.
6. Simplify and solve radical expressions & equations.
7. Solve quadratic equations and inequalities.
8. Graph linear & quadratic equations and inequalities.

LEARNING TASKS & ACTIVITIES:

Unit I	Review of the Real Number System
Unit II	Linear Equations, Inequalities, & Applications
Unit III	Graphs, Linear Equations, & Functions
Unit IV	Systems of Linear Equations
Unit V	Exponents, Polynomials, & Polynomial Functions
Unit VI	Factoring
Unit VII	Rational Expressions & Functions
Unit VIII	Roots, Radicals, & Root Functions
Unit IX	Quadratic Equations, Inequalities, and Functions
Unit X	Inverse, Exponential, & Logarithmic Functions

ASSESSMENT OF OUTCOMES:

The semester grade will be determined by tests as shown in the following table.

- 90-100% = A
- 80- 89% = B
- 70- 79% = C
- 60- 69% = D
- 0- 59% = F

TESTING:

1. Students demonstrate the required behavior on written examinations over the objectives.
2. No "retest" examinations will be given.
3. **Exams are to be taken at the time specified.**

HOMEWORK:

1. Problems will be chosen to help the student learn the objectives.
2. Steps for doing these selected problems will be given to the Student Success Center, along with the answers, so that students can go there to study for each chapter.

ATTENDANCE POLICY:

Students are expected to attend all classes.

STUDENT CONDUCT:

1. Behavior that interferes with the learning process will not be tolerated.
2. **Dishonest work will result in an F for the course.**
3. **No cell phones or electronic music devices are allowed during class time. Calculators are permitted for some assignments, if they are not cell phones.**

SCHEDULE OF ACTIVITIES:

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| Day 1 | Pretest/Syllabus |
| Day 2-3 | Basic Concepts & Operations on Real Numbers
Exponents, Roots, & Order of Operations
Properties of Real Numbers |
| Day 4-7 | Linear Equations in One Variable & Formulas
Applications of Linear Equations
Linear Inequalities in One Variable
Set Operations & Compound Inequalities
Absolute Value Equations & Inequalities |
| Day 8 | Test |
| Day 9-11 | Rectangular Coordinate System & Slope of a Line |

	Linear Equations & Inequalities in Two Variables
	Intro to Functions and Variation
Day 12	Test
Day 13-14	Systems of Linear Equations in Two Variables
	Systems of Linear Equations in Three Variables
	Applications of Systems
	Solving Systems by Matrix Methods
Day 15	Test
Day 16-18	Integer Exponents and Scientific Notation
	Adding and Subtracting Polynomials
	Polynomial Functions
	Multiplying and Dividing Polynomials
Day 19	Test
Day 20-22	GCF & Factoring by Grouping
	Factoring Trinomials & Special Factoring
	Solving Equations by Factoring
Day 23	Test
Day 24-26	Rational Expressions & Multiplying & Dividing
	Adding and Subtracting Rational Expressions
	Complex Fractions
	Equations with Rational Expressions & Graphs
Day 27	Test
Day 28-31	Radical Expressions & Graphs
	Rational Exponents & Simplifying Radical Express.
	Add, Subtract, Multiply, Divide Radical expressions
	Solving Equations with Radicals
	Complex Numbers
Day 32	Test
Day 33-36	The Square Root Property & Completing the Square
	The Quadratic Formula & Quadratic Equations
	Formulas & Graphs of Quadratic Functions
	Parabolas
	Quadratic & Rational Inequalities
Day 37	Test
Day 38-39	Inverse Functions, Exponential Functions
	Logarithmic Functions, & Properties of Logarithms
Day 40	Final Test

COMPETENCIES:

ADD, SUBTRACT, MULTIPLY AND DIVIDE SIGNED NUMBERS

1. Apply the rules of addition, subtraction, multiplication and division to fractions.
2. Apply the rules of addition, subtraction, multiplication and division to decimals.
3. Identify natural numbers, whole numbers, integers, rational, and irrational.
4. Apply the rules of addition, subtraction, multiplication and division to signed numbers.
5. Use the order of operation with real numbers.
6. Identify the use of the commutative, associative, identity, inverse, and distributive properties.

SOLVE EQUATIONS AND INEQUALITIES

7. Identify and solve linear equations using properties of equality.
8. Translate sentences of a word problem into an equation, and then solve the problem.
9. Solve a given formula or literal equation for a specified variable.
10. Solve problems involving geometric figures, percentages, uniform motion, and liquid mixtures.
11. Solve and graph inequalities on a number line.
12. Solve compound inequalities involving and and or statements.
13. Solve equations involving absolute value.

ADD, SUBTRACT, MULTIPLY AND DIVIDE POLYNOMIAL EXPRESSIONS

14. Apply the rules of exponents for any situation.
15. Use zero and negative numbers in exponents.
16. Express numbers in scientific notation.
17. Identify terms and coefficients.
18. Learn the vocabulary for polynomials.
19. Calculate the sum or difference of polynomials.
20. Multiply any polynomial situation.

FACTOR POLYNOMIAL EXPRESSIONS

21. Factor out the greatest common factor.
22. Factor by grouping.
23. Factor any trinomial regardless of the lead coefficient.
24. Factor trinomials by substitution.
25. Identify and factor perfect square trinomials.
26. Factor the difference of two squares.

27. Factor the sum or difference of two cubes.
28. Apply a general strategy to factor polynomials systematically.
29. Solve certain quadratic equations by factoring.
30. Solve applied problems that lead to quadratic equations.

SIMPLIFY AND SOLVE RATIONAL EXPRESSIONS

31. Find the values of a variable for which a rational expression is undefined.
32. Express rational expressions in lowest terms.
33. Multiply and divide rational expressions.
34. Rewrite rational expressions with the least common denominator.
35. Add and subtract rational expressions regardless of the denominators.
36. Simplify complex fractions.
37. Divide a polynomial by a monomial or by a polynomial with at least two terms.
38. Divide a polynomial by a polynomial of the form $x-b$ using synthetic division.
39. Evaluate a polynomial using the remainder theorem.
40. Solve equations involving rational expressions.
41. Solve word problems about distance, work, and variation using rational expressions.

SIMPLIFY AND SOLVE RADICAL EXPRESSIONS
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42. Find square roots and principal square roots.
43. Find principal n th roots.
44. Use exponent properties to simplify expressions with rational exponents.
45. Simplify radical expressions and quotients.
46. Multiply radicals and divide radicals, and simplify where possible.
47. Add and subtract radical expressions.
48. Rationalize denominators.
49. Simplify radical expressions with sums, products, and quotients.
50. Use a conjugate to rationalize a denominator.
51. Solve equations with radicals.
52. Identify extraneous solutions.

SOLVE QUADRATIC EQUATIONS AND INEQUALITIES
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53. Express square roots to negative numbers in terms of i .
54. Add, subtract, multiply and divide complex numbers.
55. Solve quadratic equations using the square root property.
56. Solve quadratic equations by completing the square.
57. Solve quadratic equations by using the quadratic formula.
58. Use the discriminant to determine the nature of the solutions of a quadratic equation.
59. Calculate the sum and product of roots to determine the validity of solutions.

60. Solve fractional equations and radical equations that lead to quadratic equations.
61. Solve quadratic inequalities.

GRAPH LINEAR EQUATIONS AND INEQUALITIES
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62. Write a solution as an ordered pair.
63. Complete ordered pairs for a given equation.
64. Plot ordered pairs.
65. Find the midpoint and distance between two points.
66. Find x and y intercepts for a line.
67. Graph linear equations.
68. Find and interpret the slope of a line.
69. Use slope to determine the planar relationship of two lines.
70. Write the equation of a line regardless of supplied information.
71. Solve problems involving the equations of parallel and perpendicular lines.
72. Graph linear inequalities.
73. Solve problems involving direct and inverse variation.

This syllabus is subject to revision with prior notification to the student by the instructor

