

Coffeyville Community College

MATH-102
COURSE SYLLABUS
FOR
INTERMEDIATE ALGEBRA

Zach Binder
Instructor

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

CREDIT HOURS: 3

INSTRUCTOR: Zach Binder

OFFICE LOCATION: Math/Science Office Area

OFFICE PHONE: 620-251-7700 ext. 2049

OFFICE HOURS: As posted on the office door

PREREQUISITE(S): A minimum score of 31 on the Algebra Test of the COMPASS or credit in Introductory Algebra.

REQUIRED TEXT AND MATERIALS: *Intermediate Algebra*, Lial/Miller

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.
6. Simplify and solve radical expressions.
7. Solve quadratic equations and inequalities.
8. Graph linear equations and inequalities.

LEARNING TASKS & ACTIVITIES:

Unit I	Real Number, Chapter 1:1-43
Unit II	First Degree Equations and Inequalities in One Unknown, Chapter 2:46-93
Unit III	Linear Functions, Chapter 3:125-205
Unit IV	Systems of Equations, Chapter 4:207-276
Unit V	Factoring and Products, Chapter 5:278-359
Unit VI	Fractions, Chapter 6:361-429
Unit VII	Rational Exponents and Radicals, Chapter 7:432-499
Unit VIII	Quadratic Functions and Inequalities, Chapters 8:499-578

Unit IX Exponential and Logarithmic Functions, Chapter
9:581-647

**ASSESSMENT OF
OUTCOMES:**

The semester grade will be determined by tests (70%) and homework (30%) 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. Homework will be assigned to help the student learn the objectives.
2. Homework is due at the time specified by the instructor. Late homework will not be accepted.

**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.

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

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.