

Coffeyville Community College

MATH-105
COURSE SYLLABUS
FOR
COLLEGE ALGEBRA

Mark Hart
Instructor

COURSE NUMBER: MATH-105 **COURSE TITLE:** College Algebra
CREDIT HOURS: 3
INSTRUCTOR: Mark Hart
OFFICE HOURS: See schedule posted on the office door
PREREQUISITE(S): A minimum score of 45 on the Algebra Test of the COMPASS or credit in Intermediate Algebra.

REQUIRED TEXT AND MATERIALS: College Algebra, 9th Edition by Lial/Hornsby/Schneider

COURSE DESCRIPTION: Topics included in the course are quadratic equations, ratio, proportion and variation, complex numbers, determinants, and elimination theory and inequalities.

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

1. Understand the basic rules of Algebraic Expressions.
2. Solve given linear and quadratic equations.
3. Understand linear and quadratic relations and functions.
4. Understand exponential and logarithmic functions.
5. Solve given systems of equations.
6. Understand elementary probability and statistics.

LEARNING TASKS & ACTIVITIES: The class will meet during the scheduled class time for recitation and discussion of selected chapters from the text. A traditional lecture approach will be used. Homework regarding the discussed material will be assigned at the end of each class period. Periodic quizzes will also be given to assess comprehension.

Unit I, Chapter 1:1-82
Unit II, Chapter 2:83-137
Unit III, Chapter 3:195-219, 4:270-283
Unit IV, Chapter 5:346-422
Unit V, Chapter 6:424-523
Unit VI, Chapter 8:613-623

ASSESSMENT OF OUTCOMES: Grades of A (90-100), B (80-89), C (70-79), D (60-69), and F (0-59) are given in this course. An incomplete is given if previously agreed upon by the instructor with a specific time designated for

the completion of the incomplete work. Please note the college's policy on incompletes as stated in the college catalog.

Tests **MUST** be taken on the scheduled day and during the regular class period. **ONLY** if arrangements are made with the instructor **PRIOR** to the original test date will a student be allowed to take the test early. Due to abuse in the previous policy, no student will be allowed to makeup a test. Current policy allows each student one drop test to accommodate unforeseen circumstances and the subsequent failure to be tested on the scheduled test date.

A student's final course grade will be based only upon exams. Exams are worth 50 points of credit. **Partial credit is given on exams so show all work.** In the event that there would be extra credit given on a test, partial credit is not given in the extra credit problems. There will be approximately 6 tests with the lowest test dropped. **Homework will be assigned but will not be taken up.** *Even though homework will not be picked up it should be done in order to better study for the exams since many questions on the exams come directly out of homework or class notes.*

LATE TESTS ARE NOT GIVEN. IF YOU MISS A TEST IT COUNTS AS YOUR DROPPED TEST AT THE END OF THE SEMESTER. IF YOU ARE GOING TO BE ABSENT DURING TEST DAY DUE TO A COLLEGE EVENT YOU MUST TAKE THE TEST EARLY.

**ATTENDANCE
POLICY:**

The Field Kindley High School attendance policy applies to all students enrolled in school. The attendance policy is intended to encourage students to be regular in their attendance.

It is the responsibility of the parents to see that their students attend school. The school program cannot reach pupils who are not present. Thus compulsory school attendance is necessary and the school district requires regular attendance in compliance with the state laws (Kansas Statue No. 72-4802).

Any secondary student who misses more than eight (8) days in one semester from any one class is in danger of not receiving credit for such a class or course. This means that a student who is absent more than the above policy allows may require an extra semester to graduate. Exceptions to this are as follows:

1. School-sponsored trips, events and activities will not be counted as days absent.
2. Illness of a student which requires hospitalization or home confinement will not be charged against the student's eight (8) days, providing the illness and subsequent hospitalization or home confinement **are verified by a physician in writing no later than 24 hours following the return to school.**
3. Absence for a funeral or death of immediate family or grandparents, aunts or uncles will not count against the eight (8) days.

Absences verified by a parent note or phone call does not exempt the absences from the attendance policy. **If a student misses 10 days and/or classes in a semester, the administration will determine the approval of excuses for any further days/classes missed.** Absences without a valid approved excuse will be noted as unexcused. A parent's note or phone call does allow the student to make up any work missed while absent for an excused reason. Students eighteen years of age or older are NOT exempt from the attendance policy.

Parents must notify the attendance office within 24 hours of their child's absence. Notification of the absence after the 24-hour period will not excuse the student's absence unless special arrangements have been made with the principal or assistant principal.

NOTICE:

Out of respect for your classmates, when you enter the classroom please turn off your cell phone. Remember that your time in the class should be spent listening; not taking calls. Thank you.

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

COMPETENCIES:

UNIT I

The student will understand the basic rules of algebraic expressions.

1. Define:
 - a. Naturals
 - b. Wholes
 - c. Integers
 - d. Rationals
 - e. Irrationals
 - f. Reals
2. Given a number identify the sets from objective 1 to which the number belongs
3. Define:
 - a. a^n where $a \in \mathbf{R}$, $n \in \mathbf{N}$
 - b. a^{-n} where $a \in \mathbf{R}$, $a \neq 0$, $n \in \mathbf{N}$
 - c. a^0 where $a \in \mathbf{R}$
 - d. $\sqrt[n]{a}$ where $a \in \mathbf{R}$, $n \in \mathbf{N}$
 - e. $a^{m/n}$ where $a \in \mathbf{R}$, $m/n \in \mathbf{Q}$
4. State and prove the exponent rules for natural number exponents
5. Simplify given exponent phrases
6. List the properties of real numbers by name and symbolic representation
7. Given a statement list the properties of real numbers being illustrated
8. Simplify a given statement using properties of real numbers
9. Define polynomial
10. Perform operations on given polynomials
11. Factor a given polynomial
12. Define the addition, subtraction, multiplication, and division of rational expressions
13. Perform operations on given rational expressions
14. State and prove the Rules for Radicals.
15. Simplify a given phrase containing radicals
16. List the components of a Logic Structure
17. State the Binomial Theorem

TEXT: Chapter R:1-84

UNIT II

The student will solve given linear and quadratic equations.

1. Define:
 - a. linear equation in one variable
 - b. complex numbers
 - c. quadratic equation in one variable
2. Solve a given linear equation
3. Perform operations on complex numbers

4. State and prove the quadratic formula
5. Solve a given quadratic equation
6. Work word problems using the above concepts

TEXT: Chapter 1:85-180

UNIT III

The student will understand linear and quadratic relations and functions.

1. Define
 - a. Relation
 - b. Function
 - c. Linear Relation
 - d. Quadratic Function
 - e. Slope
2. State that the graph of a
 - a. linear relation is a straight line
 - b. quadratic relation is a parabola
3. State and prove: If $y = mx + b$ then m is the slope and b is the y intercept
4. Graph a line given information about it
5. Find the slope of a line given information about it
6. Write the equation of a line given information about it
7. State and prove:
 - a. If $y = a(x - h)^2 + k$ then the vertex is (h, k)
 - b. If $y = ax^2 + bx + c$ then the x coordinate of the vertex is $-b/2a$
8. Write the equation of a parabola given information about it
9. Given the equation of a parabola find the vertex and graph it
10. Work word problems using the above concepts

TEXT: Chapter 2, 3:182-313

UNIT IV

The student will understand exponential and logarithmic functions.

1. Define exponential function
2. Evaluate given:
 - a. exponential expressions
 - b. exponential functions
3. Graph given exponential functions
4. Solve given exponential equations
5. Define logarithmic function
6. State and prove the seven properties of logarithms
7. Given an exponential equation write the corresponding logarithmic equation
8. Given an logarithmic equation write the corresponding exponential equation

9. Evaluate given logarithmic expressions
10. Simplify given log statements using objective 6
11. State and prove that $\log_a x = \log_b x / \log_b a$
12. Solve given logarithmic equations
13. Work word problems using the above concepts

TEXT: Chapter 4:389-472

UNIT V

The student will solve given systems of equations.

1. Solve Systems of linear equations using:
 - a. substitution
 - b. addition
 - c. Gauss-Jordan
 - d. Cramer's Rule
2. Define
 - a. matrix
 - b. determinant
3. Find the determinant of a given matrix
4. Solve given linear programming problems

TEXT: 5: 473-580

UNIT VI

The student will understand elementary probability and statistics.

1. Define
 - a. Pascal's Triangle
 - b. $n!$
 - c. $1!$
 - d. $0!$
 - e. ${}_n P_r$
2. State the Binomial Theorem
3. Expand a given expression of the form $(x + y)^n$ using objective 2
4. Find the r^{th} term of a given binomial expansion
5. State the fundamental principle of counting
6. Define:
 - a. independent events
 - b. $p(n,r)$
7. Find the number of ways a given event can occur
8. Evaluate:
 - a. $p(n,r)$

- b. $\binom{n}{r}$
9. Define probability of Event E.
10. State:
- a. $P(E \cap F) = P(E) + P(F) - P(E \cup F)$
- b. Five properties of probabilities
11. Find the probability that a given event will occur

TEXT: Chapter 7:625-702

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