Syllabus
MATH 1150
College Algebra
2023

Committee Members:

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Facilitator: Chad Swanson

The Institution agrees to the contents in this syllabus including course prefix, number, course description and other contents of this syllabus.

Chief Academic Officer, Central Community College	04/04/2023	Adopt
Loretta Broberg Chief Academic Officer, Little Priest Tribal College	03/23/2023	Adopt
Tom McDonnell Chief Academic Officer, Metropolitan Community College	04/03/2023	Decline
Jody Tomanek Chief Academic Officer, Mid-Plains Community College	03/23/2023	Adopt
Chief Academic Officer, Nebraska Indian Community College	03/24/2023	Adopt
Charlene Widener Chief Academic Officer, Northeast Community College	03/23/2023	Adopt
Joel Michaelis Chief Academic Officer, Southeast Community College	04/06/2023	Adopt
Grant Wilson Chief Academic Officer, Western Nebraska Community College	03/23/2023	Adopt

I. CATALOG DESCRIPTION

MATH1150
College Algebra
Prerequisite: Appropriate placement or Intermediate Algebra

Catalog Description: This course is the study of relations, functions and their graphs, equations and inequalities, polynomial and rational functions, exponential and logarithmic functions, systems of equations and inequalities.

3.0 semester hours; 4.5 quarter hours
Contact hours per semester: 45

II. COURSE OBJECTIVES/COMPETENCIES

A. Course will:
1. Demonstrate various techniques to solve equations and inequalities, including numerical, analytical and graphical
2. Introduce how to analyze and manipulate functions and their graphs
3. Demonstrate how to analyze and apply polynomial functions
4. Demonstrate how to analyze rational functions
5. Demonstrate how to analyze and apply exponential and logarithmic functions
6. Demonstrate various techniques to solve systems of equations and inequalities

III. STUDENT LEARNING OUTCOMES

A. Students will be able to:
1. Solve equations and inequalities analytically and graphically
2. Analyze and manipulate functions and their graphs
3. Analyze polynomial functions
4. Analyze rational functions
5. Analyze and apply exponential and logarithmic functions.
6. Solve systems of equations and inequalities

IV. COURSE CONTENT/TOPICAL OUTLINE

A. Functions and Graphs:
- Represent functions numerically, graphically, and algebraically.
- Identify the domain and range of functions.
- Recognize graphs of basic functions and determine their domains
- Build new functions from basic functions by adding, subtracting, multiplying, dividing, and composing functions.
- Find inverses of functions graphically and analytically
- Algebraically and graphically represent translations, reflections, stretches, and compression of functions.
- Evaluate and graph piecewise functions.

B. Polynomial and Rational Functions
- Analyze and graph linear functions and use them to model authentic situations.
- Analyze and graph quadratic functions and use them to model authentic situations.

- Identify end behavior, find real zeros, and graph polynomial functions.
- Divide polynomials using long division and/or synthetic division.
- Apply the remainder and factor theorems.
- Factor polynomials with real coefficients and find complex roots.
- Describe the graphs of rational functions by identifying intercepts, horizontal and vertical asymptotes.
- Solve polynomial and rational equations.
- Solve polynomial and rational inequalities.

C. Exponential and Logarithmic Functions:

- Evaluate exponential and logarithmic expressions
- Identify and graph exponential and logarithmic functions
- Model authentic situations using exponential and logarithmic functions
- Convert equations between logarithmic form and exponential form.
- Apply the properties of logarithms to rewrite expressions.

Solve exponential and logarithmic equations.

D. Systems of Equations and Inequalities

- Solve systems of equations graphically and algebraically
- Model authentic situations using systems of equations.
- Solve systems of inequalities graphically

V. INSTRUCTIONAL MATERIALS

A. Approved Suggested Textbooks and/or Materials:

1. Algebra & Trigonometry-Sullivan
2. College Algebra – Graphs & Models; Bittinger
3. Precalculus: Larson
4. College Algebra; Trigsted
5. College Algebra; Lial, Hornsby, Schneider, Daniels; Pearson
6. College Algebra; Blitzer
7. Reasoning with Functions; Dana Center Mathematics Pathways
8. College Algebra; Gustafson, Hughes
9. Open Stax – College Algebra

B. Materials: Scientific or Graphing calculator

VI. METHODS OF PRESENTATION

A. Lecture
B. Discussion
C. Demonstration
D. Application
E. Online
F. Distant Education

VII. METHODS OF EVALUATION

Course grades at the determination of the instructor may include class and group participation, daily work, exams, projects, papers and/or a portfolio. Instructors will discuss evaluation and his/her grading policies with students at the beginning of each term.

VIII. SPECIFIC COURSE REQUIREMENTS

Course requirements are determined by the instructor.