



Course Prefix/Number/Title: MATH 103 College Algebra

Number of Credits: 4

Course Description:

Relations and functions, equations and inequalities, complex numbers, polynomial, rational, exponential and logarithmic functions, systems of equations, matrices and determinants, sequences and summations.

Pre-/Co-requisites: MATH 102 or appropriate Math Placement Test Scores

Course Objectives:

1. Students will demonstrate an understanding of relations and functions as evidenced by classroom activities and objective tests
2. Students will be able to work with equations and inequalities as evidenced by classroom activities and objective tests
3. Students will be able to work with complex numbers as evidenced by classroom activities and objective tests
4. Students will be able to work with rational and polynomial expressions as evidenced by classroom activities and objective tests
5. Students will be successful in working with exponential and logarithmic functions as evidenced by classroom activities and objective tests
6. Students will be able to solve systems of linear equations as evidenced by classroom activities and objective tests
7. Students will create and use matrices to solve systems of equations as evidenced by classroom activities and objective tests.

Instructor: Scott Grochow

Office: Rugby High School

Office Hours: None

Phone: 701-776-5201

Email: scott.j.grochow@dakotacollege.edu

Lecture/Lab Schedule: M-F8:35- 9:25

Textbook(s): Precalculus with Limits Ron Larson
TI-83 or TI-84 Series

Course Requirements:

The sequential nature of mathematics deems it necessary for students to attend class on a regular basis, therefore one of the course requirements is regular attendance. Grades will be based on exams and selected homework assignments using the following scale. The exams and assignments cannot be made up without special permission from the professor. FINAL EXAM WILL BE GIVEN DURING THE SCHEDULED TIME.

A = 90-100%

B = 80-89%

C = 70-79%

D = 60-69%

F= 59-0%

Tentative Course Outline:

Chapter 1

Functions and Their Graphs

Introduction to the Library of Functions

Lines in a Plane

Functions

Graphs of Function

Shifting, Reflecting and Stretching Graphs

Arithmetic of Functions

Composite Functions

Inverse Functions

Scatter Plots and Linear Models

Chapter 2 Polynomial and Rational Functions

Quadratic Functions

Polynomial Functions of Higher Degree

Real Zeros of Polynomial Functions

Complex Numbers

The Fundamental Theorem of Algebra

Rational Functions and Asymptotes

Graphs of Rational Functions

Quadratic Models

Chapter 3 Exponential and Logarithmic Functions

Exponential Functions and Graphs

Logarithmic Functions and Graphs

Properties of Logarithms

Solving Exponential and Logarithmic Equations (Annuities and Loans)

Exponential and Logarithmic Models

Nonlinear Models

Chapter 4 Matrices

Matrices for organizing data

Adding Subtracting Determinant of Matrices

Matrix Multiplication and Inverses

Applications with Matrices

Chapter 5 Linear systems

Solving Systems of Linear Equations
Solving Systems of Two Variable Equations (Non Linear)
Solving Systems with 3 or more Variables using
Gaussian Elimination
Augmented Matrices
Matric Equations
Cramer's Rule
Applications of Multivariable Equations

Chapter 6 Conic Sections

Circles
Parabolas
Ellipses
Hyperbolas

General Education Competency/Learning Outcome(s) OR CTE Competency/Department Learning Outcome(s):

Competency/Goal 3: Demonstrates the ability to solve a variety of mathematical problems

Learning Outcome 1: Utilizes mathematical skills to solve problems
Learning Outcome 2: Employs critical thinking skills to solve problems

Relationship to Campus Focus:

The student will use the graphing calculator to model application problems in nature, economics, science, psychology, etc. Communication with others will be emphasized.

Classroom Policies:

Please refrain from any behavior that would disrupt the class. Cell phones can only be used in emergency situations and they must be turned to vibrate. The academic environment is an open and harassment free environment. Participation is encouraged.

Student Email Policy:

Dakota College at Bottineau is increasingly dependent upon email as an official form of communication. A student's campus-assigned email address will be the only one recognized by the Campus for official mailings. The liability for missing or not acting upon important information conveyed via campus email rests with the student.

Academic Integrity:

According to the DCB Student Handbook, students are responsible for submitting their own work. Students who cooperate on oral or written examinations or work without authorization share the responsibility for violation of academic principles, and the students are subject to disciplinary action even when one of the students is not enrolled in the course where the violation occurred. The Code detailed in the Academic Honesty/Dishonesty section of the Student Handbook will serve as the guideline for cases where cheating, plagiarism or other academic improprieties have occurred.

Disabilities or Special Needs:

Students with disabilities or special needs (academic or otherwise) are encouraged to contact the instructor and Disability Support Services.

Title IX:

Dakota College at Bottineau (DCB) faculty are committed to helping create a safe learning environment for all students and for the College as a whole. Please be aware that all DCB employees (other than those designated as confidential resources such as advocates, counselors, clergy and healthcare providers) are required to report information about such discrimination and harassment to the College Title IX Coordinator. This means that if a student tells a faculty member about a situation of sexual harassment or sexual violence, or other related misconduct, the faculty member must share that information with the College's Title IX Coordinator. Students wishing to speak to a confidential employee who does not have this reporting responsibility can find a list of resources on the DCB Title IX webpage.

AI Student Policy:

Unless otherwise indicated in the course syllabus, or in individual instructions for course assignments, or in the absence of the express consent of the course instructor, students are not allowed to utilize generative AI to help produce any of their academic work. Any violation of this policy will be considered an act of academic dishonesty as outlined within the Dakota College Code of Student Life.

RESPONSIBILITIES

Students	• Responsible to follow the syllabus and assignment instructions regarding use of generative AI for all academic work. • Obtain permission of the instructor prior to the use of generative AI that is outside of the syllabus or assignment instructions. Provide appropriate rationale for how the use of generative AI will enhance the learning experience for the assignment. • In instances where generative AI is permissible, appropriately cite the generative AI program used and indicate where in the assignment it was used, in a brief submission statement.
Faculty	• Determine if the use of generative AI could enhance student learning in any assignment or project. • Clearly indicate in all course syllabi if generative AI is allowable for any academic work. • If allowable, give specific parameters for how and when generative AI may be used. • If a violation of generative AI for the individual course/syllabus is suspected, discuss the concern with the student. If violation is still suspected, inform the appropriate semester coordinator/program director.