

Course Outline

COURSE: MATH 8A **DIVISION:** 10 **ALSO LISTED AS:** MATH 8

TERM EFFECTIVE: Spring 2021 **CURRICULUM APPROVAL DATE:** 11/10/2020

SHORT TITLE: FIRST HALF PRECALCULUS

LONG TITLE: First Half of Precalculus

<u>Units</u>	<u>Number of Weeks</u>	<u>Type</u>	<u>Contact Hours/Week</u>	<u>Total Contact Hours</u>
4	18	Lecture:	4	72
		Lab:	0	0
		Other:	0	0
		Total:	4	72

COURSE DESCRIPTION:

Math 8A prepares the student for the study of calculus by providing important skills in algebraic interpretation, and problem solving at the college level. Topics will include basic algebraic concepts, complex numbers, equations and inequalities of the first and second degree, functions, and graphs, linear and quadratic equations, polynomial functions, exponential and logarithmic functions, systems of equations, and matrices. **PREREQUISITE:** Mathematics 240 with a grade of 'C' or better or skills equivalent to those in an Intermediate Algebra course or appropriate placement.

PREREQUISITES:

- Completion of MATH 233, as UG, with a grade of C or better.
- OR
- (Completion of MATH 233A, as UG, with a grade of C or better.
- AND Completion of MATH 233B, as UG, with a grade of C or better.)
- OR
- Completion of MATH 235, as UG, with a grade of C or better.
- OR
- Completion of MATH 240, as UG, with a grade of C or better.
- OR
- Completion of MATH 242, as UG, with a grade of C or better.
- OR
- Completion of MATH 3, as UG, with a grade of C or better.
- OR
- Completion of MATH 5, as UG, with a grade of C or better.
- OR
- Completion of MATH 6, as UG, with a grade of C or better.
- OR

Completion of MATH 7, as UG, with a grade of C or better.
OR
Completion of MATH 1A, as UG, with a grade of C or better.
OR
Completion of MATH 1B, as UG, with a grade of C or better.
OR
Completion of MATH 1C, as UG, with a grade of C or better.
OR
Score of 33 on Intermediate Algebra
OR
Score of 13 on Pre-Calculus
OR
Score of 2800 on Accuplacer Math
OR
Score of 2600 on MM CCCApply Math
OR
Score of 2600 on MM Placement Tool Math

COREQUISITES:

CREDIT STATUS: D - Credit - Degree Applicable

GRADING MODES

L - Standard Letter Grade

REPEATABILITY: N - Course may not be repeated

SCHEDULE TYPES:

02 - Lecture and/or discussion

05 - Hybrid

71 - Dist. Ed Internet Simultaneous

72 - Dist. Ed Internet Delayed

STUDENT LEARNING OUTCOMES:

By the end of this course, a student should:

1. Solve a wide variety of equations and inequalities including absolute value, radical, rational, exponential, logarithmic and polynomial.
2. Identify and perform transformations on the graphs of elementary (radical, absolute value, etc.), polynomial (linear, quadratic, cubic), rational, exponential, and logarithmic functions.
3. Solve systems of equations and inequalities using graphing, elimination, substitution techniques, matrix algebra, and determinants.
4. Explain the concept of a function, perform the arithmetic operations of functions, identify the domain of a function, and analyze graphs of functions.
5. Recognize the relationship between inverse functions graphically and through composition.
6. Recognize functional patterns in data and apply functions to model real-world applications.
7. Graph polynomial functions and characterize the real and complex zeros of polynomials.
8. Locate the asymptotes and zeros of rational functions analytically and graph a rational function.

CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS

Curriculum Approval Date: 11/10/2020

HOURS: 14

Equations, Inequalities and Modeling

Performance Objectives: Students will review solving and graphing linear equations in one and two variables, quadratic equations, absolute value equations and inequalities, radical equations, and rational equations. Students will perform algebraic manipulations on expressions encountered in a first semester calculus course.

Students will use a calculator to construct scatter diagrams and perform linear and quadratic regressions.

HOURS: 16

Functions and Graphs

Performance Objectives: Students will study functions and their graphs. They will investigate function notation, domain and range, transformations and symmetry, operations with functions including composition, inverse functions, even/odd functions, and piecewise functions. Students will perform transformations on the graphs of elementary functions (radical, absolute value, etc.). Students will construct mathematical models.

HOURS: 16

Polynomial and Rational Functions

Performance Objectives: Students will analyze and learn to graph linear, quadratic, polynomial and rational functions. Students will identify end behavior, asymptotic behavior, intercepts, and vertices.

They will characterize real and complex zeros of polynomials and apply the Fundamental Theorem of Algebra.

Students will perform transformations on the graphs of polynomial and rational functions. They will solve polynomial and rational inequalities using sign charts and graphs. Students will construct mathematical models.

HOURS: 16

Exponential and Logarithmic Functions

Performance Objectives: Students will study and analyze exponential functions. Emphasis will be placed on the number e , and on using exponential functions in the modeling of growth and decay. Students will study logarithms learning their uses and applications. Students will learn to recognize the distinguishing characteristics

of exponential functions and will employ regression analysis to generate exponential functions from appropriate

raw data. Students will perform transformations on the graphs of exponential and logarithmic functions. They will solve exponential and logarithmic equations.

HOURS: 8

Systems of Equations and Inequalities

Performance Objectives: Students will investigate methods for solving linear systems of equations in two and

three variables, and nonlinear systems. Students will investigate methods for solving linear systems using matrices. They will also learn partial fraction decomposition, systems of inequalities in two variables, and linear

programming.

HOURS: 2

Final Exam

METHODS OF INSTRUCTION:

Instruction will follow a standard lecture/discussion format. Extensive homework will be assigned in order to assure mastery of the concepts covered in class. Students will also be required to utilize technology, both calculators and computer software, to enhance their understanding of the material. Students will be given opportunities to work together on problems given in class and group projects.

OUT OF CLASS ASSIGNMENTS:

Required Outside Hours: 144

Assignment Description:

1. Analyze and study pertinent text material, solved examples and lecture notes.
2. Apply principles and skills covered in class by solving regularly-assigned homework problems.
3. Regularly synthesize course materials in preparation for exams.
4. Projects to apply concepts learned in class

METHODS OF EVALUATION:

Writing assignments

Percent of total grade: 10.00 %

Out-of-class projects.

Problem-solving assignments

Percent of total grade: 10.00 %

Homework, quizzes.

Objective examinations

Percent of total grade: 80.00 %

In-class written exams.

REPRESENTATIVE TEXTBOOKS:

Sullivan & Sullivan. Precalculus: Concepts Through Functions, A Unit Circle Approach to Trigonometry, 4th edition. Pearson, 2018.

ISBN: ISBN-10: 0134686977 ISBN-13: 978-0134686974

Reading Level of Text, Grade: 12 Verified by: Jennifer Nari

ARTICULATION and CERTIFICATE INFORMATION

Associate Degree:

GAV B4, effective 200430

CSU GE:

CSU B4, effective 200430

IGETC:

IGETC 2A, effective 200430

CSU TRANSFER:

Transferable CSU, effective 200430

UC TRANSFER:

Transferable UC, effective 200430

SUPPLEMENTAL DATA:

Basic Skills: N

Classification: Y

Noncredit Category: Y

Cooperative Education:

Program Status: 1 Program Applicable

Special Class Status: N

CAN:

CAN Sequence:

CSU Crosswalk Course Department:

CSU Crosswalk Course Number:

Prior to College Level: Y

Non Credit Enhanced Funding: N

Funding Agency Code: Y

In-Service: N

Occupational Course: E

Maximum Hours:

Minimum Hours:

Course Control Number: CCC000166253

Sports/Physical Education Course: N

Taxonomy of Program: 170100