MAT201 | **Precalculus**

Course Text

Miller, Julie and Donna Gerken. *Precalculus*, 2nd edition, McGraw-Hill, 2023. ISBN: 9781260260458

The text is provided digitally as part of the course enrollment. Students may find used, new, or rental print copies by searching for the ISBN.

Course Description

This course provides a working knowledge of concepts and applications of equation solutions, graphs, and trigonometry. It begins with a review of algebraic basics. Emphasis is on linear, polynomial, exponential, logarithmic, and trigonometric functions and their graphs. Students will model scenarios with all of these functions and with graphs. They will also use trigonometric identities to simplify expressions. Other topics include series and sequences, systems of equations, and matrices.

Learning Outcomes

After completing this course, students will be able to:

1. Solve linear, quadratic, exponential, trigonometric, and other equations and inequalities.
2. Model scenarios with linear, quadratic, exponential, trigonometric, and other equations and inequalities.
3. Create and interpret graphs of various functions.
4. Apply degree and radian measures to solve real-world problems.
5. Use reference angles and the six trigonometric ratios to identify points along the unit circle.
6. Evaluate and simplify trigonometric expressions.
7. Use trigonometric functions to solve a right triangle and apply the Law of Sines and the Law of Cosines to solve triangles that are acute or obtuse.
8. Differentiate between Cartesian coordinates, polar coordinates, and vectors.
9. Solve systems of linear equations and inequalities by hand and with matrices.
10. Calculate the nth element of a sequence and the sum of a series.

Course Prerequisites

It is suggested, but not required, that students take a College Algebra course or its equivalent before enrolling in Precalculus.

Academic Integrity Statement

Academic integrity is the pursuit of scholarly activity in an honest, truthful and responsible manner. Violations of academic integrity include, but are not limited to, plagiarism, cheating, fabrication and academic misconduct. Failure to comply with the Academic Integrity Policy can result in a failure and/or zero on the attempted assignment/examination, a removal from the course, disqualification to enroll in future courses, and/or revocation of an academic transcript. Penalties for academic integrity violations can be retroactively applied upon discovery, and at our discretion.

Course Completion Policy

In order for a course to be considered complete, **all required coursework must be attempted, submitted, and graded.** Required coursework consists of graded assignments. Any Academic Integrity Policy violations may prevent a course from being considered complete.

Course Evaluation Criteria

Your score provides a percentage score and letter grade for each course. A passing percentage is 70% or higher.

There are a total of 1000 points in the course:

Topic	Assessment	Points	Learning Outcomes
2	Graded Review: Chapter 1	40	1, 2, 3
3	Graded Quiz: Chapter 1 & 2	80	1, 2, 3
4	Graded Exam: Chapters 1-3	150	1, 2, 3
5	Graded Review: Chapter 4	40	3, 4, 5
6	Graded Review: Chapter 5	40	6
7	Graded Quiz: Chapters 4-6	80	7
8	Graded Exam: Chapters 4-7	150	8
9	Graded Review: Chapter 8	40	9
10	Graded Quiz: Chapters 8 & 9	80	9
12	Graded Final Exam	300	1-10
Total		1000	

Course Roadmap *Graded items in* ***bold***

Intro | Introduction and Getting Started

Subtopics	Assignments
• Welcome	• Welcome Video

- Academic Honesty

- Academic Honesty and Integrity Lesson
- Statement of Academic Honesty and Integrity (required)

Topic 1 | Review of Prerequisites

Subtopics

- Number Sets
- Rational Expressions
- Operations on Exponents and Radicals
- Solution of Polynomials by Factoring and Other Methods
- Application of Equations
- Linear, Compound, and Absolute Value Inequalities

Assignments

- Pre-Reading: What Do You Think?
- Chapter R Reading
- Chapter R Presentation
- Practice Review: Chapter R

Topic 2 | Functions and Relations

Subtopics

- Rectangular Coordinates and the Graph of a Line
- Graphs of Circles
- Functions and Relations
- Linear Equations and Functions in Two Variables
- Transformations on a Graph
- Test for Symmetry
- Graph of Piecewise-Defined Functions
- The Algebra and Composition of Functions

Assignments

- Pre-Reading: What Do You Think?
- Chapter 1 Reading
- Chapter 1 Presentation
- Practice Review: Chapter 1
- **Graded Review: Chapter 1**

Topic 3 | Polynomial and Rational Functions

Subtopics

- Quadratic Functions and Applications
- Polynomial Functions
- Zeros of Polynomials
- Graphing Polynomial Functions
- Rational Functions
- Graphing Rational Functions with Asymptotes
- Polynomial and Rational Inequalities
- Variation

Assignments

- Pre-Reading: What Do You Think?
- Chapter 2 Reading
- Chapter 2 Presentation
- Practice Review: Chapter 2
- **Graded Quiz: Chapters 1 & 2**

Topic 4 | Exponential and Logarithmic Functions

Subtopics

- Inverse Function
- Exponential and Logarithmic Functions
- Applications of Exponential and Logarithmic Equations
- Modeling with Exponential and Logarithmic Functions

Assignments

- Pre-Reading: What Do You Think?
- Chapter 3 Reading
- Chapter 3 Presentation
- Practice Review: Chapter 3
- Pathfinder: Analyzing Graphs
- **Graded Exam: Chapters 1-3**

Topic 5 | Trigonometric Functions

Subtopics

- Special Angles and the Unit Circle
- Graphs of Basic Trigonometric Functions
- Applications of Basic Trigonometric Functions
- The Inverse Trigonometric Functions and Their Applications

Assignments

- Pre-Reading: What Do You Think?
- Chapter 4 Reading
- Chapter 4 Presentation
- Practice Review: Chapter 4
- **Graded Review: Chapter 4**

Topic 6 | Analytic Trigonometry

Subtopics

- Family of Trigonometric Identities
- All Trigonometric Formulas
- Trigonometric Equations

Assignments

- Pre-Reading: What Do You Think?
- Chapter 5 Reading
- Chapter 5 Presentation
- Practice Review: Chapter 5
- Pathfinder: Rules of Logarithms and Trigonometric Identities
- **Graded Review: Chapter 5**

Topic 7 | Applications of Trigonometric Functions

Subtopics

- The Law of Sines
- The Law of Cosines
- More Applications of Trigonometry

Assignments

- Pre-Reading: What Do You Think?
- Chapter 6 Reading
- Chapter 6 Presentation
- Practice Review: Chapter 6
- Pathfinder: Graphs of Sine and Cosine Functions

- **Graded Quiz: Chapters 4-6**

Topic 8 | Polar Coordinates and Vectors

Subtopics

- Relating Polar Coordinates to Rectangular Coordinates
- Graphing Polar Equations
- Vectors
- Dot Product of Vectors

Assignments

- Pre-Reading: What Do You Think?
- Chapter 7 Reading
- Chapter 7 Presentation
- Practice Review: Chapter 7
- **Graded Exam: Chapters 4-7**

Topic 9 | Systems of Equations and Inequalities

Subtopics

- Solving Systems of Linear Equations Graphically, by Substitution, and by the Addition Method
- Solving Systems of Nonlinear Equations in Two Variables
- Systems of Inequalities in Two Variables
- Linear Programming

Assignments

- Pre-Reading: What Do You Think?
- Chapter 8 Reading
- Chapter 8 Presentation
- Practice Review: Chapter 8
- **Graded Review: Chapter 8**

Topic 10 | Matrices

Subtopics

- Solving Linear Systems
- Using Matrix Equations

Assignments

- Pre-Reading: What Do You Think?
- Chapter 9 Reading
- Chapter 9 Presentation
- Practice Review: Chapter 9
- Pathfinder: Linear Programming
- **Graded Review: Chapter 9**

Topic 11 | Sequences and Series

Subtopics

- Terms of Sequences and Series
- Summation
- Arithmetic Sequences and Series
- Geometric Sequences and Series

Assignments

- Pre-Reading: What Do You Think?
- Chapter 11 Reading
- Chapter 11 Presentation
- Practice Review: Chapter 11

- Preparing for Your Proctored Final Exam

Topic 12 | Review and Final Exam

Assignments

- Pathfinder: Comprehensive Math Activity
- Final Exam Preparation Guide
- **Final Exam**
- End of Course Survey

Related Courses

CHEM101: General Chemistry I

CHEM101L: General Chemistry I Lab

BIO201: Anatomy and Physiology I