

NCBS 453M: JUST-IN-TIME SUPPORT FOR MATH 48C - MPS

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Fall 2026
Units:	0
Hours:	5 lecture per week (60 total per quarter)
Corequisite:	MATH 48C.
Degree & Credit Status:	Non-Degree-Applicable Non-Credit Course Basic Skills
Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Pass/No Pass Only
Repeatability:	Unlimited Repeatability

Student Learning Outcomes

- Students will be able to solve problems involving applications of trigonometric functions
- Students will develop conceptual understanding of trigonometric functions
- Students will demonstrate an ability to solve equations
- Students will assess their own learning process and performance in preparation for calculus

Description

A just-in-time approach to the core prerequisite skills, competencies, and concepts needed in Precalculus III. Intended for students majoring in science, technology, engineering, and mathematics who are concurrently enrolled in MATH 48C for the Math Performance Success program (MPS) at Foothill College. Topics include a review of skills, including developing a knowledge of function families with their graphs and behavior, transformations, average rate of change, inverses, and compositions. Functions include trigonometric functions, and polar and parametric equations.

Course Objectives

The student will be able to:

1. Explore topics related to developing effective learning skills.
2. Graph, analyze, and transform trigonometric functions.
3. Graph and analyze polar and parametric equations.
4. Recognize the relationship between functions and their inverses.
5. Solve application problems using trigonometric functions and model real world applications.
6. Understand and compute rates of change.
7. Use technology, such as graphing calculators and/or computer software, to assist in solving problems involving any of the topics in (1) through (6) above.

8. Discuss mathematical problems and write solutions in accurate mathematical language and notation.
9. Interpret mathematical solutions.

Course Content

1. Explore topics related to developing effective learning skills
 - a. Learn study skills
 - i. Organizational skills
 - ii. Time management
 - iii. Test preparation
 - iv. Test-taking skills
 - b. Self-assess using performance criteria to judge and improve one's own work
 - i. Analyze and correct errors on one's exam
 - ii. Self-assess one's understanding of specific mathematical concepts
 - iii. Develop and execute a plan to deepen understanding
 - c. Identify, utilize, and evaluate the effectiveness of resources in improving one's own learning, such as study groups, computer resources, lab resources, and tutoring resources
2. Graph, analyze, and transform trigonometric functions
 - a. Use function notation
 - i. Evaluate functions
 - ii. Be able to convert words representing function relationships into symbolic and graphical representation
 - b. Recognize each function type
 - c. Explore the behavior of graphs
 - i. Increasing and decreasing
 - ii. Local extrema
 - d. Find domain and range
 - e. Transform graphs
 - i. Identify and graph the change in a function that results from shifts, reflections, stretches, and compressions
 - ii. Be able to recognize the change in a graph of a function when a combination of transformations is applied
 - iii. Understand the concept of symmetry of functions
 - iv. Odd, even, or neither
 - f. Compose and combine functions
 - g. Solve equations
3. Graph and analyze polar and parametric equations
 - a. Find tables of values
 - b. Graph equations
4. Recognize the relationship between functions and their inverses
 - a. Determine the domain over which the trigonometric function has an inverse
 - b. Properties of inverse functions
 - c. Notation
5. Solve application problems using trigonometric functions and model real world applications
 - a. Create an appropriate model from a verbal description or graph
 - b. Use chosen models to solve application problems
 - c. Interpret solutions
6. Understand and compute rates of change
 - a. Calculate average rate of change from a table, graph, or an equation

- b. Understand the implications of a function that has a constant or variable rate of change
 - c. Interpret the meaning of an average rate of change in the context of a applications
- 7. Use technology, such as graphing calculators and/or computer software, to assist in solving problems involving any of the topics in (1) through (6) above
 - a. Calculator/computer utilities for evaluating problems involving optimization
 - b. Calculator/computer utilities for finding zeros or roots of functions
- 8. Discuss mathematical problems and write solutions in accurate mathematical language and notation
 - a. Application problems from other disciplines
 - b. Proper notation
- 9. Interpret mathematical solutions
 - a. Explain the significance of solutions to application problems

Discipline(s)

Mathematics

Lab Content

Not applicable.

Special Facilities and/or Equipment

- 1. Access to graphing technology, such as a graphing calculator or graphing software
- 2. When taught online or hybrid:
 - a. Internet access
 - b. Course management system
 - c. Specific software related to the course

Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Written homework
Quizzes and tests

Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

Lecture
Discussion
Cooperative learning exercises

Representative Text(s) and Other Materials

Boelkins, Matthew. [Active Prelude to Calculus](#). 2019.

Abramsom, Jay. [Precalculus, 2nd ed. \(Openstax\)](#). 2024.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

- 1. Problem sets
- 2. Exploratory activities and/or projects
- 3. Reading and/or writing assignments