

# NCBS 411A: JUST-IN-TIME SUPPORT FOR MATH 1A

## Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2025
Units:	0
Hours:	2.5 lecture per week (30 total per quarter)
Corequisite:	MATH 1A.
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 assess their own learning process and performance in single variable differential calculus
- Students will be able to solve problems involving applications of algebraic and transcendental functions in the context of single variable differential calculus
- Students will demonstrate an ability to compute limits and rates of change for algebraic and transcendental functions
- Students will develop conceptual understanding of algebraic and transcendental functions in the context of single variable differential calculus

## Description

A just-in-time approach to the core prerequisite skills, competencies, and concepts needed in Calculus I. Intended for students who are concurrently enrolled in MATH 1A at Foothill College and who want extra support in calculus. Topics include: a review of skills developed in precalculus, including developing a knowledge of function families with their graphs and behavior, transformations, average rate of change, inverses, and compositions.

## Course Objectives

The student will be able to:

1. Explore topics related to developing effective learning skills.
2. Apply topics related to algebraic and transcendental functions.
3. Manipulate and evaluate expressions used to calculate limits and derivatives.
4. Analyze the qualitative behavior of graphs of various algebraic and transcendental functions.
5. Use algebraic and transcendental functions to model real world applications.

## 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
  - 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. Apply topics related to algebraic and transcendental functions
  - a. Function notation
  - b. Graphs of base curves and their transformation
  - c. Composite and inverse functions
  - d. Average rate of change
  - e. Piecewise defined functions
  - f. Polar and parametric curves
3. Manipulate and evaluate expressions used to calculate limits and derivatives
  - a. Difference quotient
  - b. Simplifying expressions in the evaluation of limits
  - c. Simplifying expressions in the process of differentiation
4. Analyze the qualitative behavior of graphs of various algebraic and transcendental functions
  - a. Increasing and decreasing
  - b. Local extrema
  - c. Concavity
  - d. Points of inflections
5. Use algebraic and transcendental functions to model real world applications
  - a. Read and interpret word problems
  - b. Related rates
  - c. Optimization

## 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/hybrid: Internet access, course management system, specific software related to the course.

## Method(s) of Evaluation

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

Group and independent exploratory activities  
Homework  
Performance in MATH 1A

## Method(s) of Instruction

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

Group work  
Discussion  
Mini-lectures  
Instructor-guided discovery  
Formative assessment

## Representative Text(s) and Other Materials

Boelkins, Matthew. [Active Calculus](#). 2023.

Strang, Gilbert, and Edwin Herman. [Calculus Volume I \(Openstax\)](#). 2023.

Briggs, William, and Lyle Cochran. [Calculus: Early Trancedentials, 3rd ed.](#). 2018.

## 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

## Discipline(s)

Mathematics