

NCBS 411C: JUST-IN-TIME SUPPORT FOR MATH 1C

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Fall 2026
Units:	0
Hours:	2.5 lecture per week (30 total per quarter)
Corequisite:	MATH 1C.
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 demonstrate the ability to model lines and planes in space and calculate partial and directional derivatives of functions of multiple variables
- Students will develop conceptual understanding of sequences and series and functions of multiple variables and their rates of change
- Students will solve problems involving applications of functions of multiple variables and series
- Students will assess their own learning process and performance in MATH 1C

Description

A just-in-time approach to core prerequisite skills, competencies, and concepts needed in Calculus III. Intended for students who are concurrently enrolled in MATH 1C 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 and relationship families with their graphs and behavior, transformations, domain and range, distance formulas, vectors, parametric equations, and the geometry of lines and triangles.

Course Objectives

The student will be able to:

- Explore topics related to developing effective learning skills.
- Apply topics related to algebraic and transcendental functions.
- Manipulate and evaluate expressions used to calculate limits, derivatives, integrals, and series.
- Analyze the qualitative behavior of graphs of various algebraic and transcendental functions.
- Use algebraic and transcendental functions to model real world applications.
- Apply topics from Calculus I and Calculus II to Calculus III.

Course Content

- Explore topics related to developing effective learning skills
 - Learn study skills
 - Organizational skills
 - Time management
 - Test preparation
 - Test-taking skills
 - Self-assess using performance criteria to judge and improve one's own work
 - Analyze and correct errors on one's exam
 - 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
- Apply topics related to algebraic and transcendental functions
 - Function notation
 - Graphs of base curves and their transformation
 - Composite and inverse functions
 - Solving nonlinear systems in two or three variables
 - Parametric curves
- Manipulate and evaluate expressions used to calculate limits, derivatives, integrals, and series
 - Difference quotient
 - Simplifying expressions in the evaluation of limits
 - Simplifying expressions in the process of differentiation
 - Simplifying expressions in the process of evaluating series
- Analyze the qualitative behavior of graphs of various algebraic and transcendental functions
 - Increasing and decreasing
 - Local extrema
 - Concavity
 - Points of inflection
- Analyze the qualitative behavior of graphs of conic sections
 - Circles
 - Parabolas
 - Hyperbolas
 - Ellipses
- Use algebraic and transcendental functions to model real world applications
 - Read and interpret word problems
 - Optimization
- Apply topics from Calculus I and Calculus II to Calculus III
 - Limit definition of derivative
 - Interpretation of derivative
 - Relationship between a function and its derivatives
 - Techniques of differentiation
 - Critical points
 - Differentials
 - Tangent line approximation

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 1C

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.

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