

# From the Classroom to the Community: Guiding Undergraduate Student Teams to Create OER-Based Online Courses for Inclusive and Equitable Learning

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Project Website

# Project Goals



## **Develop Set of Courses on Canvas**

Precalculus, College Algebra, Multivariable Calculus, Statistics



## **Open**

Available to the public



## **Strengthen Diversity**

Support a wide range of students across campus.



## **Assess Impact**

Site Analytics, Online Surveys



## **Disseminate**

OER Repositories, Canvas Commons, Conferences

# Support

## **May 2023 to December 2024**

- Georgia Tech Center for Promoting Inclusion and Equity in the Sciences
- Howard Hughes Medical Institute (HHMI) Inclusive Excellence Grant

## **May 2024 to December 2024**

- Affordable Learning Georgia Continuous Improvement grant
- The Georgia Tech Distance Mathematics Program

# Timeline



# Open Course Features

## College Algebra

The screenshot shows the 'The Open College Algebra Course Site' interface. It features a sidebar with navigation options: Home, Modules, Discussions, and Grades. The main content area is titled 'Recent Announcements' and includes a link to 'The Open College Algebra Course Site'. Below this, there is a section for 'The Open Course Site Initiative' with a brief description of the project's goals and a 'Start Here' button.

## Precalculus

The screenshot shows the 'The Open Precalculus Course Site' interface. It features a sidebar with navigation options: Home, Modules, Discussions, and Grades. The main content area is titled 'Recent Announcements' and includes a link to 'The Open Precalculus Course Site'. Below this, there is a section for 'The Open Course Site Initiative' with a brief description of the project's goals and a 'Start Here' button.

## Multivariable Calculus

The screenshot shows the 'Open Multivariable Calculus Site' interface. It features a sidebar with navigation options: Home, Modules, Grades, Quizzes, People, GT Student Resources, and Media Gallery. The main content area is titled 'The Open Multivariable Calculus Site' and includes a link to 'Open Course Site | Multivariable Calculus'. Below this, there is a section for 'The Open Course Site Initiative' with a brief description of the project's goals and a 'Start Here' button.

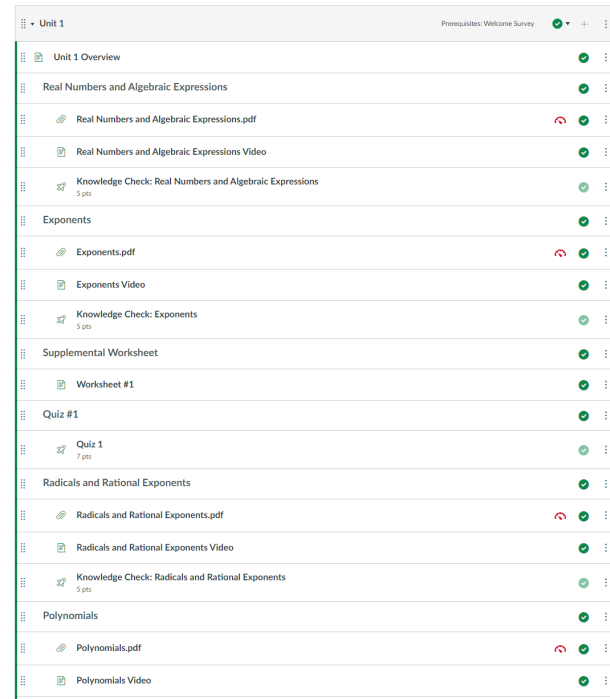
## Statistics

The screenshot shows the 'Open Resources for Statistics' interface. It features a sidebar with navigation options: Home, Assignments, Discussions, Grades, People, Pages, Files, Quizzes, Modules, Collaborations, Chat, Office 365, TurnInPoint, CLOS, Budget, and Ed Discussion. The main content area is titled 'Open Resources for Statistics' and includes a link to 'Open Resources for Statistics'. Below this, there is a section for 'Welcome' with a brief description of the course and a 'Course Creation' button.

- Canvas
- Canvas Quizzes
- Pre-recorded video
- Site content exported as QTI
- User tracking
- Surveys
- Conditional release: users must complete surveys to access content

# College Algebra and Precalculus

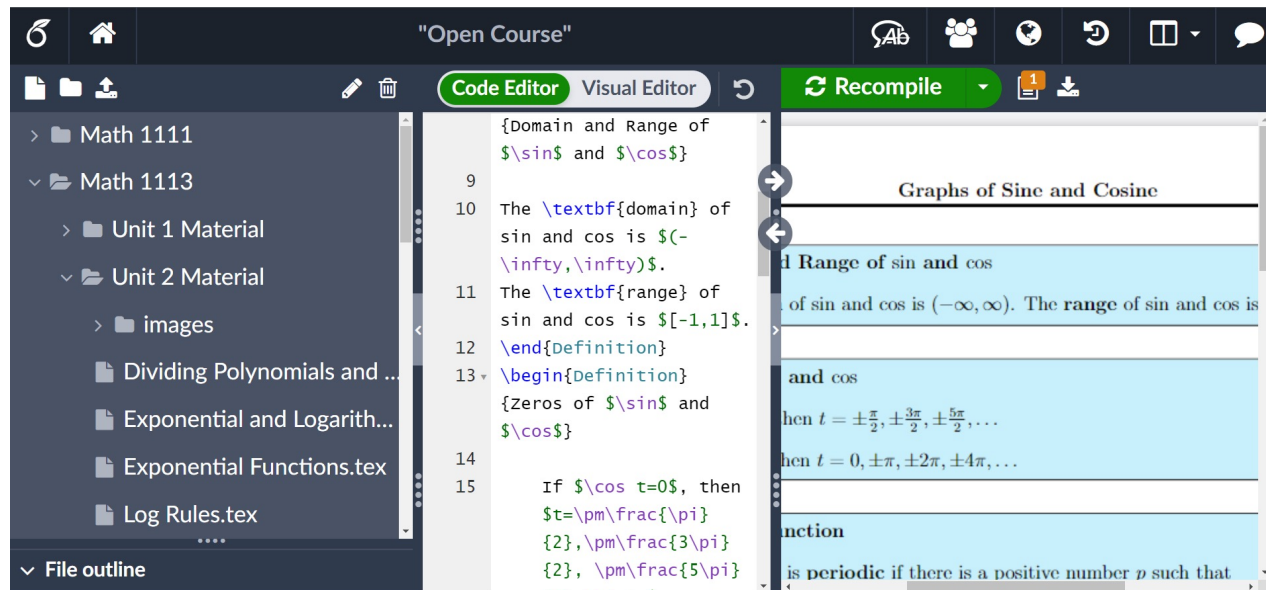
- Course divided into units by topics
- Roughly 75 pre-recorded lecture videos
- Notes and worksheets posted with additional exercises
- Knowledge Checks, Quizzes and Exams posted as "Canvas Quizzes"
- Open-source tool to turn text files with LaTeX into Canvas Quizzes
  - <https://github.com/gpoore/text2qti>



Item	Status	Points
Unit 1 Overview	Green	
Real Numbers and Algebraic Expressions	Green	
Real Numbers and Algebraic Expressions.pdf	Red	
Real Numbers and Algebraic Expressions Video	Green	
Knowledge Check: Real Numbers and Algebraic Expressions	Green	5 pts
Exponents	Green	
Exponents.pdf	Red	
Exponents Video	Green	
Knowledge Check: Exponents	Green	5 pts
Supplemental Worksheet	Green	
Worksheet #1	Green	
Quiz #1	Green	
Quiz 1	Green	7 pts
Radicals and Rational Exponents	Green	
Radicals and Rational Exponents.pdf	Red	
Radicals and Rational Exponents Video	Green	
Knowledge Check: Radicals and Rational Exponents	Green	5 pts
Polynomials	Green	
Polynomials.pdf	Red	
Polynomials Video	Green	

# Creating Course Notes with Overleaf

- Overleaf is an online LaTeX editor
- Real-time collaboration and version control make it easy for large teams to work together



# Multivariable Calculus



## Question 3

1 pts

Determine the range of  $f(x, y) = \sqrt{16 - x^2 - y^2}$ .

$\{z \mid 0 \leq z \leq 4\}$

$\{z \mid z \leq 4\}$

$\{z \mid z \geq 0\}$

$\{z \mid z \leq 0, z \geq 4\}$

- Modules and lessons align with OpenStax Textbook
- Roughly 100 pre-recorded lecture videos
- 418 quiz questions (and counting!)
- Some questions developed with help of AI

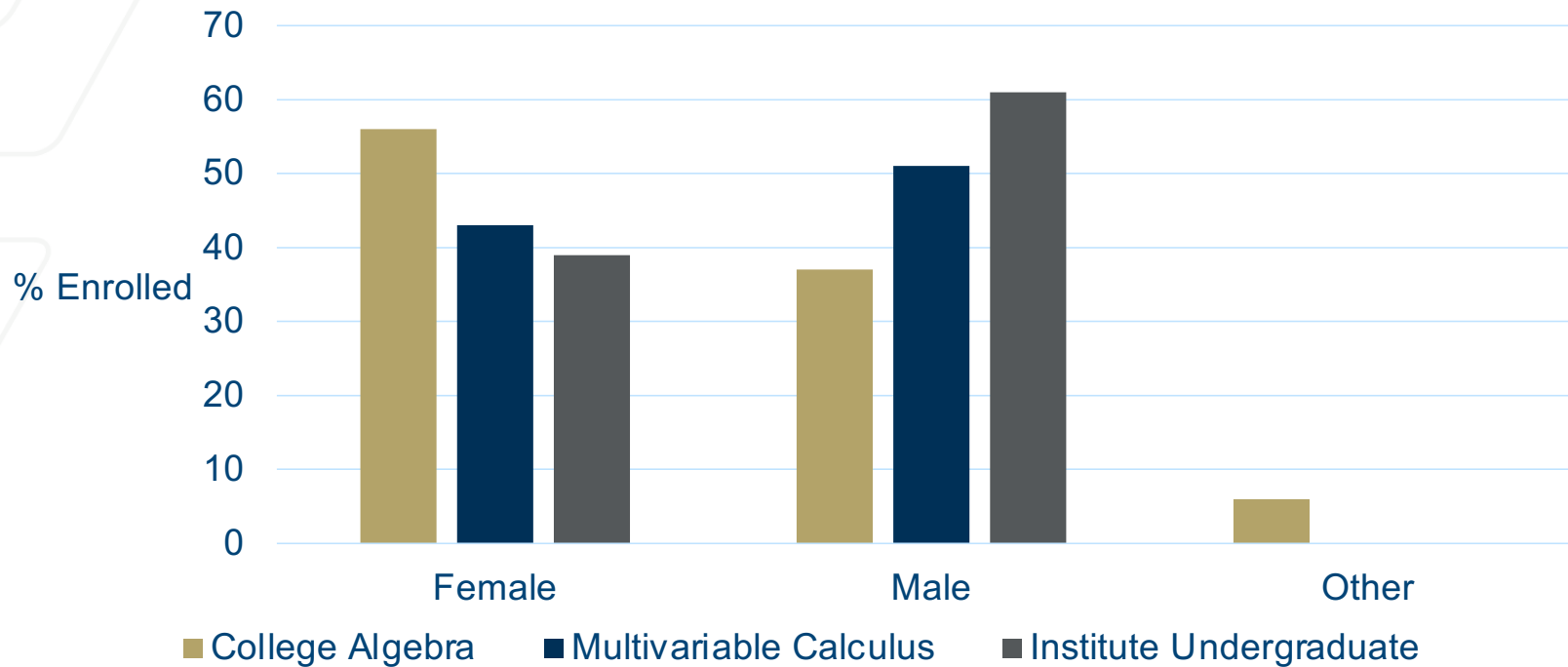


## Preliminary Data

- GT Community sites can track user engagement.
- Enrollment dependent on demand and how long our courses have been available

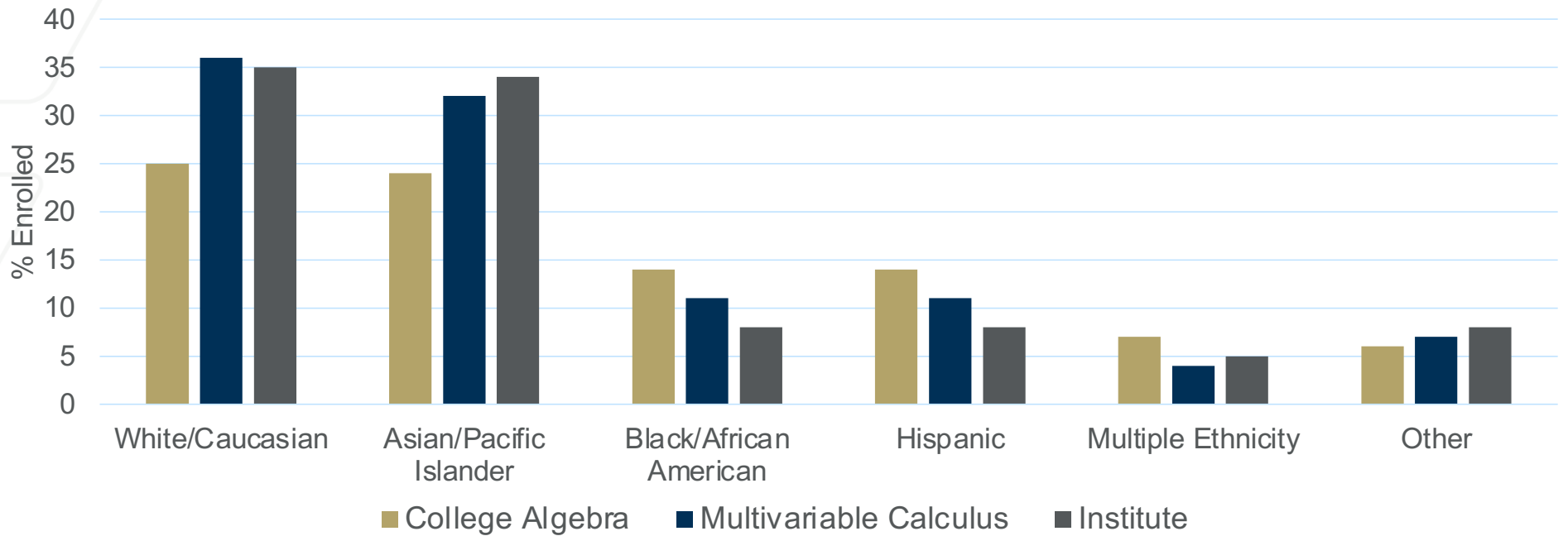
Course	Current Enrollment
College Algebra	179
Precalculus	10
Multivariable Calculus	409
Open Statistics	11

# Preliminary Data: Gender



Institute Undergraduate data from: <https://irp.gatech.edu/disclosures/student-demographics>

# Preliminary Data: Ethnicity



# Challenges

- Cannot track users on public sites
- Need two copies of each site:
  - GT Community site – requires completion of Welcome Survey to access content
  - Public site – does not collect user data
- Student assistant hiring and training
- Time required to create curriculum

# Benefits

- Supplementary resources for students across campus and beyond
- Helping transition away from publisher materials to free open access
- Statistics curriculum used as placement test
- Greater awareness of OER at our institute
- Our team of assistants are also
  - more involved in the teaching and learning of mathematics
  - career development
  - part of an open access initiative

# Where to Find Our Work

- Curriculum development still underway.
- GT Websites (for GT students only for user tracking)
  - [College Algebra](#)
  - [Precalculus](#)
  - [Multivariable Calculus](#)
  - [Statistics](#)
- Public Websites
  - [College Algebra](#)
  - [Precalculus](#)
  - [Multivariable Calculus](#)
- OER Repositories
  - Multivariable Calculus Quizzes: [OER Commons](#), [MERLOT](#)

# Questions

- We would be happy to answer any questions that you might have about our work!
- Contact information:
  - Stephanie Reikes, [sreikes7@gatech.edu](mailto:sreikes7@gatech.edu)
  - Greg Mayer, [greg.mayer@gatech.edu](mailto:greg.mayer@gatech.edu)



Project Website