Enhancing Inclusive and Equitable Instruction through Developing Open Courses in the Schools of Mathematics and Psychology

Stephanie Reikes, Greg Mayer, Hi Shin Shim, Bekki George
Natanel Ha, Cara Bennett, Melissa Leng, Amelia Powell, Claire Haskell, Sheleah Harris, Neil Dave
Georgia Institute of Technology

37th Annual Math, Engineering, and CS Conference
Perimeter College, Georgia State University, Clarkston Campus
February 2, 2024

Project Website

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Project Goals

- Funded through fellowship from
  - Georgia Tech Center for Promoting Inclusion and Equity in the Sciences
  - Howard Hughes Medical Institute (HHMI) Inclusive Excellence Grant
- Using existing OER and our own course materials to develop interactive websites that students can engage in at **any point** during their studies.

Develop Open Courses
College Algebra
Multivariable Calculus
Introductory Statistics
Precalculus (in development)

Assess Impact
Site Analytics
Online Surveys

Disseminate
OER Repositories
Canvas Commons
Conferences

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Timeline

May 2023	Funds available Curriculum development initiated Student assistants help create and curate materials
Aug 2023	Course sites launched for Georgia Tech students (sign-on required to track engagement)
Oct 2023	Public sites launched (no user tracking)
Dec 2023	First Year Assessment Report for program sponsors
Feb 2024	MECS Conference!
Apr 2024	Curriculum development phase wraps up
Dec 2024	Second Year Assessment Report for program sponsors

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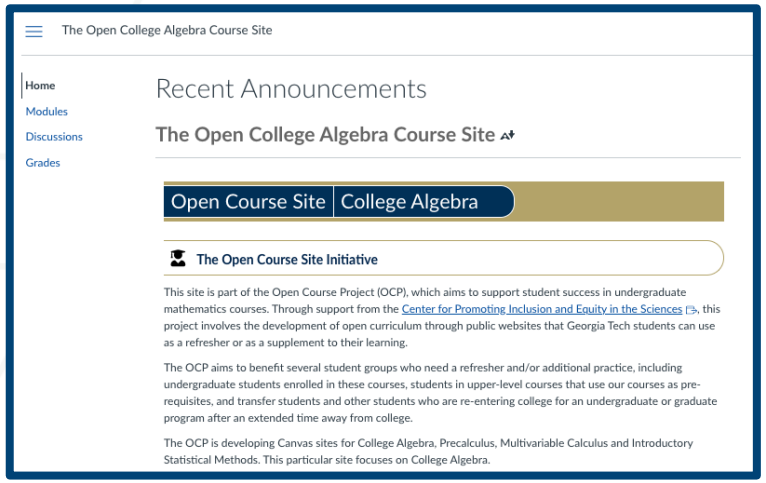
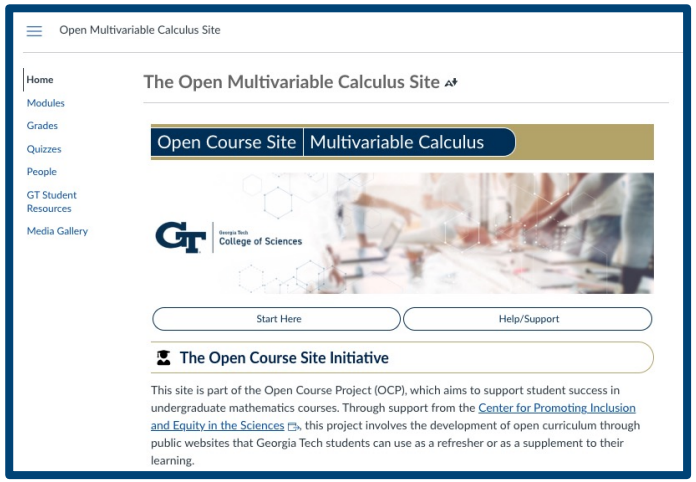
Open Course Features

College Algebra



Multivariable Calculus



Statistics

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

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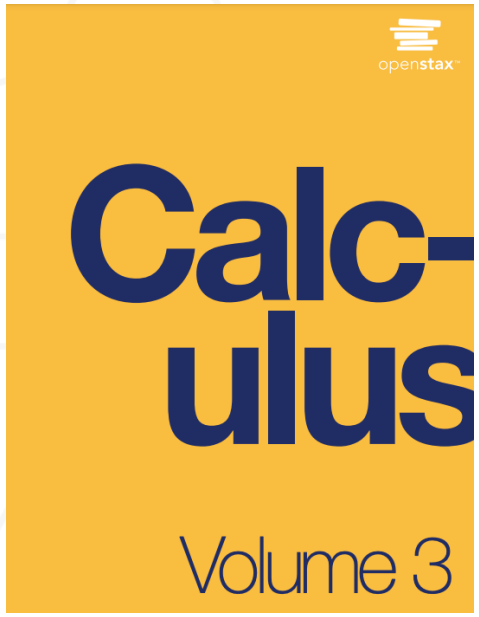
Multivariable Calculus



Question 3 1 pts

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

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

- Course divided into modules and lessons that align with OpenStax Textbook
- Roughly 100 pre-recorded lecture videos
- 288 quiz questions (and counting!)
- Some questions developed with help of ChatGPT (eg – ideas for answer choices)

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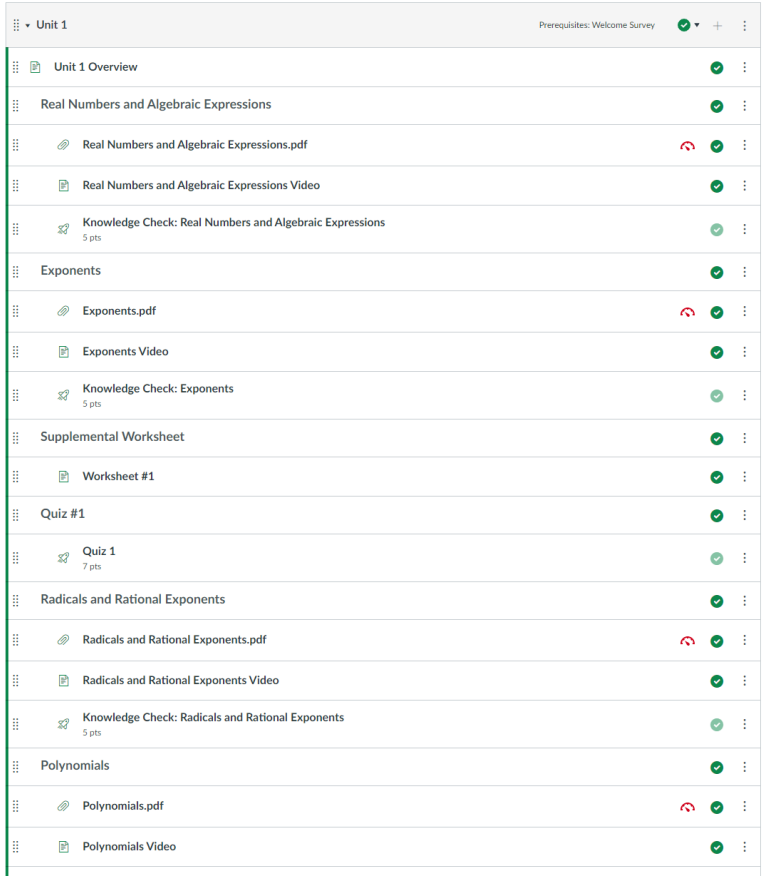
College Algebra and Precalculus

- Course divided into units by topics
- Roughly 75 pre-recorded lecture videos
- Notes and Worksheets posted with additional problems
- Knowledge Checks, Quizzes and Exams posted as "Canvas Quizzes"



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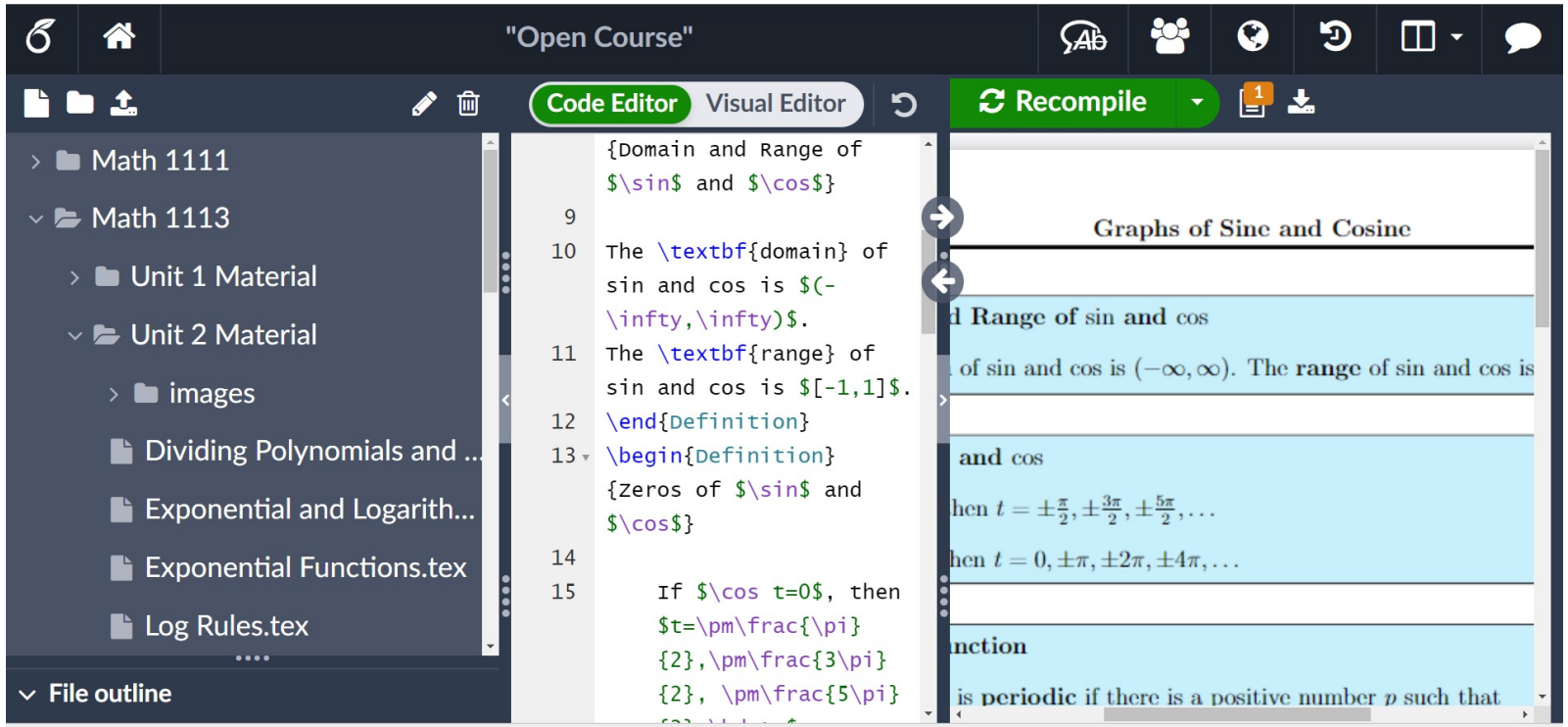
Creating Course Notes with Overleaf

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



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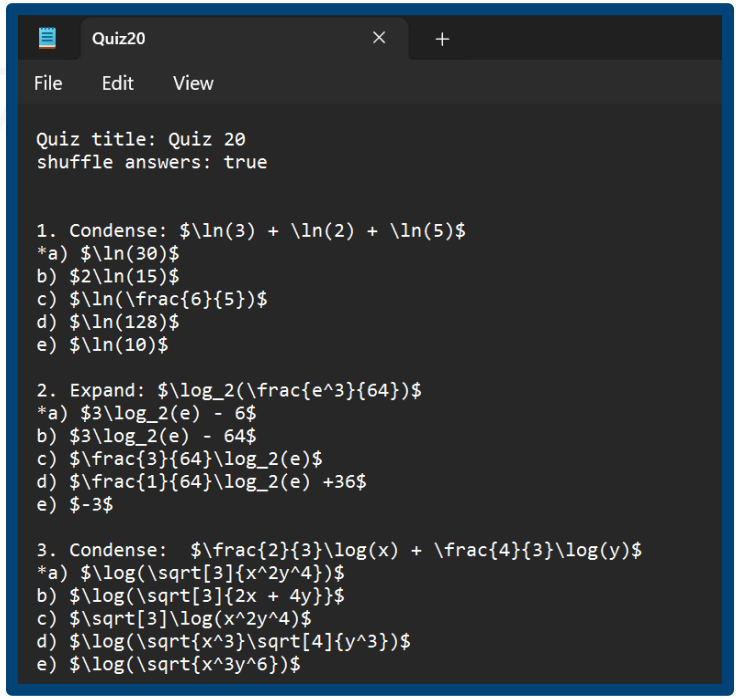
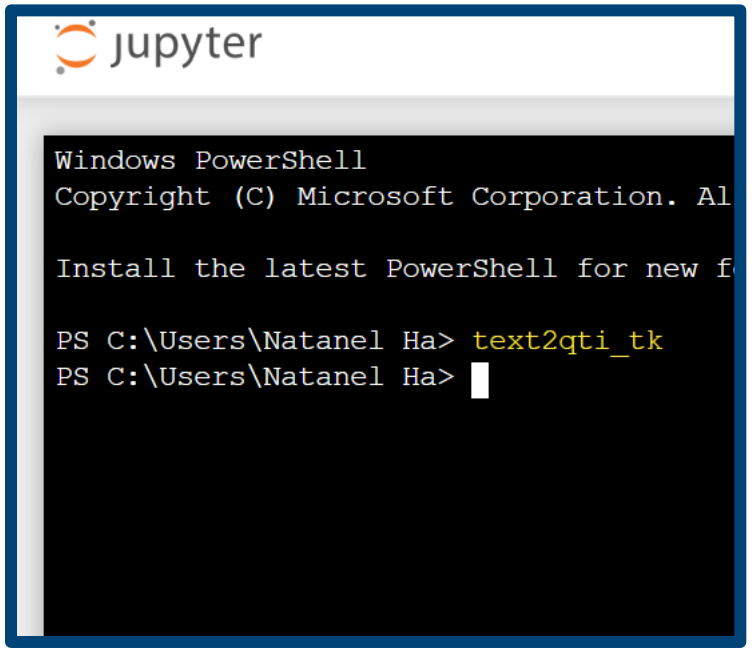
Making Canvas Quizzes with text2Qti

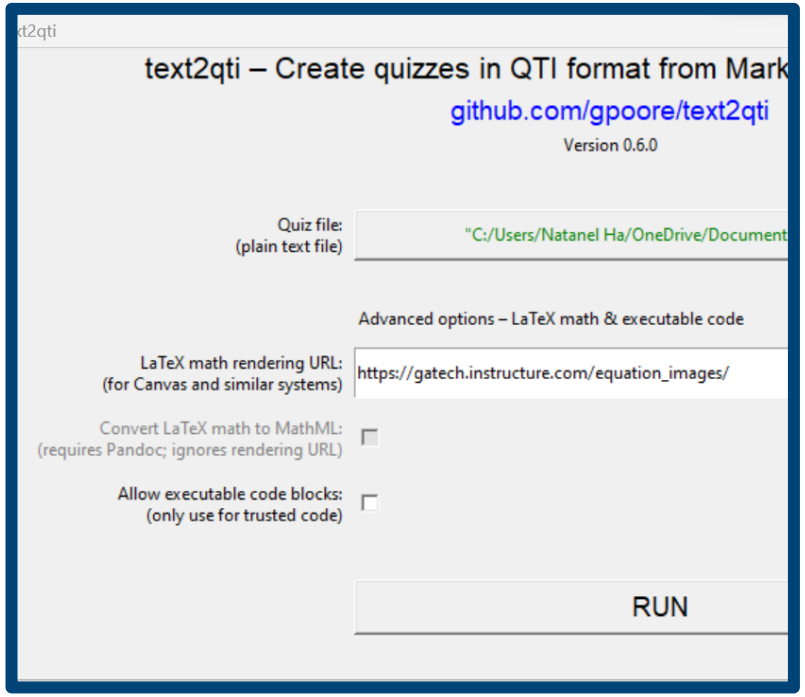
- Open-source tool to turn text files with LaTeX into Canvas Quizzes
  - https://github.com/gpoore/text2qti



1) Write a .txt file with LaTeX



2) Open text2qti window using python terminal



3) Find file and Run

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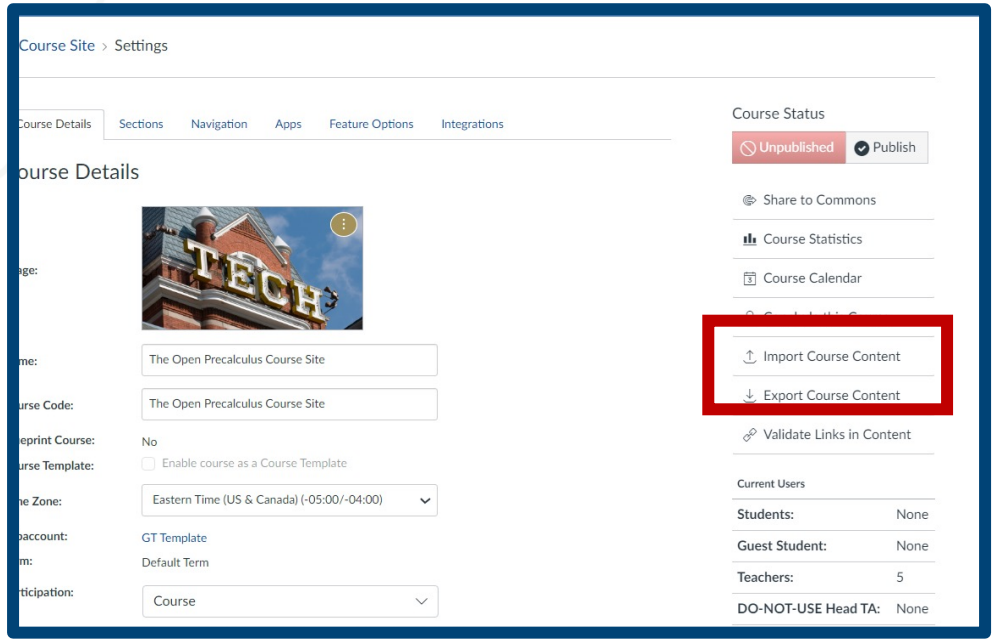
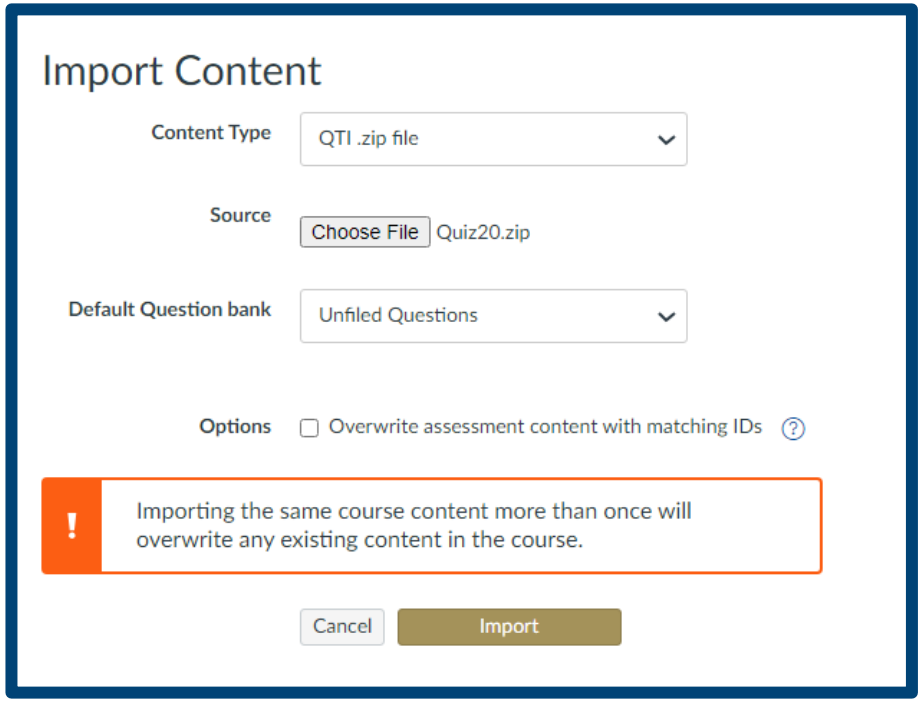
Making Canvas Quizzes with text2Qti



4) Go to setting and then click important course content



5) Find .zip file and import

- Then you're done! Settings and questions can be edited after

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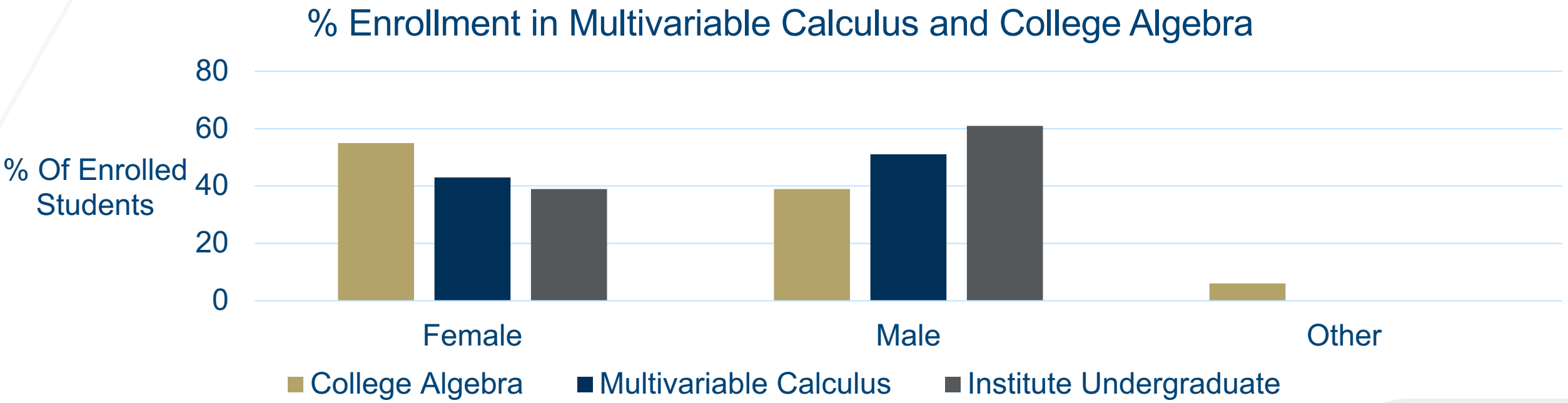
Preliminary Data

Course	Current Enrollment
College Algebra	44
Multivariable Calculus	384
Open Statistics	11



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

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Challenges

- Technical issues making a public Canvas page
- Graded quizzes not available on public Canvas sites
- We are making two copies of each site:
  - GT Community site – requires completion of a welcome survey to access content
  - Public site – does not collect user statistics
- Student assistant hiring and training

Benefits

- Using course materials current and future offers of courses
- Additional learning resources for students across campus and beyond
- Helping transition away from publisher materials to free open access
- Used statistics curriculum 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
  - Multivariable Calculus
  - Statistics
- Public Websites
  - College Algebra
  - 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
  - Greg Mayer, greg.mayer@gatech.edu
  - Hi Shin Shim, hishin@gatech.edu
  - Bekki George, bekgeorge@comcast.net

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