

# Math Pathways Course Shell Overview Webinar

*June 21, 2024*

#FLStudentSuccess

# Webinar Logistics

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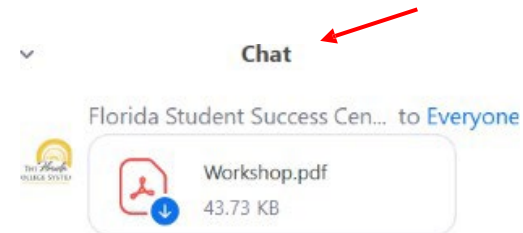
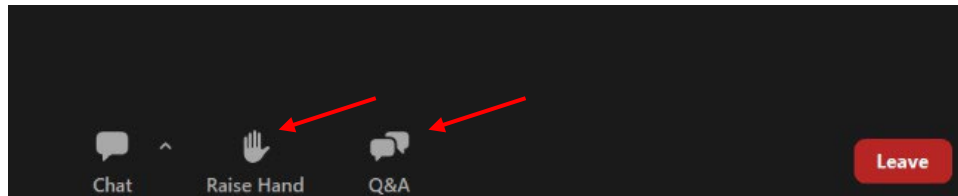
Participants will be on mute for the duration of the webinar.

Materials from today's webinar can be found in the chat area:

- Today's presentation
- Link to Math Course Shell Access Request Survey

How to submit questions:

- To submit questions during the webinar, please utilize the Q&A function. During the Q&A portion of the webinar, questions will be addressed.



# Today's Presenters

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**Kiara McCoy, Ph.D.**  
Director, Florida Student  
Success Center

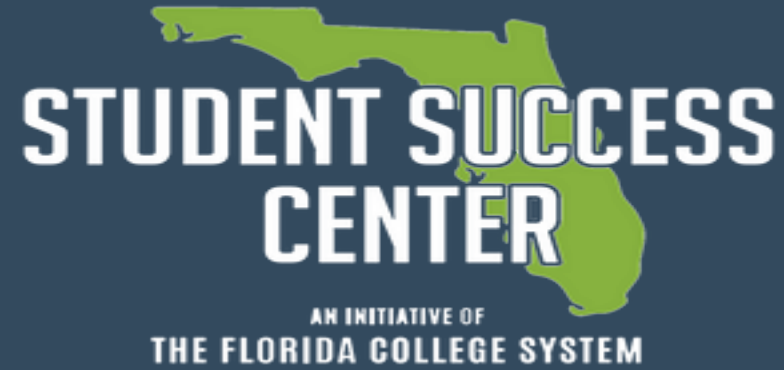


**Dr. Mike Long**  
Professor of Mathematics  
Polk State College

# Agenda

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- Florida Mathematics Re-Design
- Math Pathways Recommendations
- Course Shell Grant Overview
- Implementation at Polk State College
- Discuss how to Access Materials
- Q&A & Next Steps



# Florida Mathematics Re-Design

# Florida Student Success Center

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Launched in 2018, the Center is a part of the Division of Florida Colleges in the Department of Education.

- The Center supports the Florida College System (FCS) in efforts to develop student-centered pathways and increase student completion rates by:
  - Working collaboratively with Florida's 28 state and community colleges;
  - Creating a coherent statewide strategy so colleges can integrate their varied student success efforts, share best practices with one another and maximize resources; and
  - Providing technical assistance and professional learning opportunities.
- Mathematics pathways re-design and content alignment were the primary initiatives in the center's first year

# Why Focus on Mathematics?

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- Nationally, hundreds of thousands of students **fail** gateway postsecondary mathematics courses each year.
- College level mathematics course have been a **challenge** for student program completion.
- Florida high school, college and university faculty collaborated on a statewide initiative to improve **student success in mathematics in 2018 - 2019**.

# Mathematics Workgroups

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## *High School to Postsecondary Alignment*

**Explore how high school curriculum in mathematics aligns with postsecondary expectations**

- Clarify college entrance-requirements alignment with high school assessments and courses
- Examine longitudinal student data on mathematics sequencing and student success rates
- Engage high school and college mathematics faculty in dialogue about postsecondary expectations
- Identify strategies that promote greater alignment

## *FCS Mathematics Sequences*

**Examine multiple pathways for students to enter based on programs of study as well as the re-design of course structures to maximize support for students**

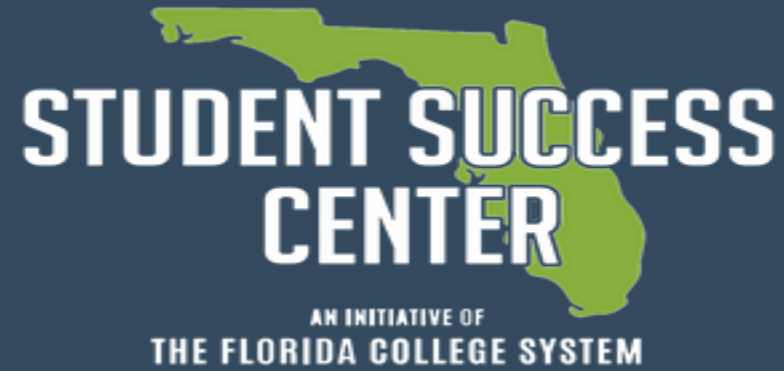
- Identify course and institutional structures that promote and deter success
- Encourage the modernization of mathematics content
- Review data on student success across algebra and non-algebra pathways
- Identify a sequence of courses in the context of a student's intended transfer major/meta-major

## *FCS to University Alignment*

**Examine how FCS curriculum in mathematics aligns with university expectations, particularly for students in transfer programs**

- Clarify university mathematics requirements
- Examine the longitudinal student data on mathematics sequencing and student success rates
- Engage FCS and SUS mathematics faculty in dialogue about postsecondary expectations
- Identify strategies that promote greater alignment





# Math Pathways Recommendations

# Florida Mathematics Re-Design Recommendations

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- Culmination of the year-long Florida Mathematics Re-Design Initiative
- Includes 11 recommendations for state policy, institutional policy and evidence-based practices designed for scale
- One of the recommendations was to “create common mathematics pathways by aligning mathematics courses to programs, meta-majors and careers in Florida”



# Mathematics Pathways Legislation

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- The pathways recommendation is reflected in SB 366 from the 2021 legislative session
- The bill states:

*"To facilitate seamless transfer of credits, reduce excess credit hours, and ensure students take the courses needed for their future career, the articulation agreement must establish three mathematics pathways for students by aligning mathematics courses to programs, meta-majors, and careers. A representative committee consisting of State University System faculty, faculty of career centers established under s.1001.44, and Florida College System institution faculty shall collaborate to identify the three mathematics pathways and the mathematics course sequence within each pathway which align to the mathematics skills needed for success in the corresponding academic programs and careers."*

# Committee's Approach: Skills vs. Courses

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- To address the ambiguity about mathematical knowledge, the committee adopted a program-level assessment to determine exactly which mathematical **skills** – opposed to **courses** – students need to be exposed to and master to be successful in the degree.
- The survey was disseminated to discipline experts at Florida College System and State University System institutions.
- Survey responses informed the foundation of the proposed mathematics pathways.

# The Pathways

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## Algebra through Calculus

*MAC X105 College Algebra, MAC X311 Calculus*

## Statistical Reasoning

*STA X023 Statistical Methods I*

## Mathematical Thinking in Context

*MGF X130 Mathematical Thinking (General Education Core), MGF X131 Mathematics in Context*

# Algebra through Calculus

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- **Pathway Description:** This pathway is intended for students whose academic program requires a foundation of algebra, followed by a sequence of courses that may lead to calculus.
- **Learning Outcomes:**
  - Demonstrate the knowledge of various algebraic relationships and their application.
  - Employ computational techniques to mathematical problem solving.
  - Execute appropriate mathematical modeling techniques for solving application problems and interpret results of solutions.
  - Develop graphical models using algebraic and problem-solving techniques.
  - Articulate a working knowledge of various functions and their application, as appropriate.
- **General Education Core Course:** MAC X105 College Algebra

# Statistical Reasoning

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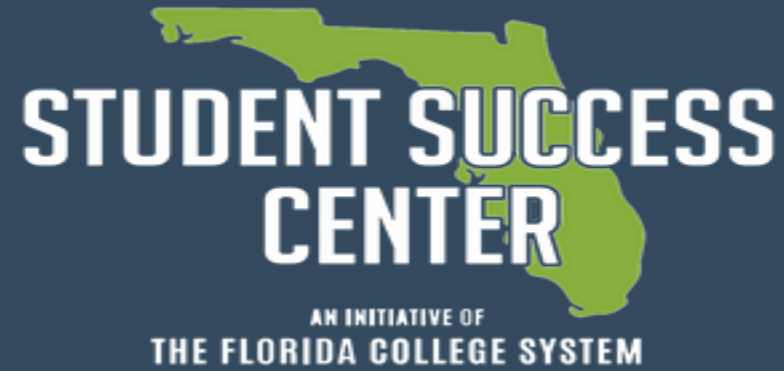
- **Pathway Description:** Statistics is inherently a data-based discipline that requires students to recognize variability in data and to take it into account to make decisions in a way that acknowledges and quantifies uncertainty. Students in the statistical reasoning pathway will gain a statistical knowledge foundation in areas such as descriptive statistics, probability, and inferential statistics that will allow them to use and interpret data.
- **Learning Outcomes:**
  - Students will analyze data using graphical and numerical methods to study patterns and departures from patterns, using appropriate technology as needed.
  - Students will critically evaluate a data-collection plan to answer a given research question.
  - Students will use probability concepts and simulation.
  - Students will use statistical models to draw conclusions from data.
  - Students will perform correlation and regression analyses.
  - Students will apply statistical reasoning and data analysis to real-world or major-specific examples.
- **General Education Core Course:** STA X023 Statistical Methods I

# Mathematical Thinking in Context

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- **Pathway Description:** This pathway recognizes mathematics as a characteristically human endeavor and is intended for students in the broadest range of programs of study. In this pathway, students will explore a variety of mathematical concepts utilizing multiple ways of thinking to formulate and solve problems in context.
- **Learning Outcomes:**
  - Determine efficient means of solving a problem through investigation of multiple mathematical models.
  - Apply logic in contextual situations to formulate and determine the validity of logical statements using a variety of methods.
  - Apply mathematical concepts visually and contextually to represent, interpret and reason about geometric figures.
  - Apply mathematical models to civically contextual situations (e.g., stocks, finance, voting, population dynamics, etc.).
  - Recognize the characteristics of numbers and utilize numbers along with their operations appropriately in context.
  - Organize, visualize and model data in a meaningful way.
  - Analyze and interpret representations of data to draw reasonable conclusions.
  - Engage in ways of thinking that may involve sample size, counting strategies, chance, ratios and proportions.
- **General Education Core Course:** MGF X130 Mathematical Thinking (new course)





# Math Pathways Course Shell Grant Overview

# FSSC Math Course Shell Grant

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In Spring 2023, the FSSC announced the Mathematics Pathways Course Development Grant opportunity for FCS and State University System (SUS) faculty and instructional designers to develop open master course shells that may be used for the instruction of gateway mathematics courses across the state of Florida. The Center funded the development of master course shells

- Two new courses: MGF X130 Mathematical Thinking and MGF X131 Mathematics in Context.
- Three existing courses: MAC X105 College Algebra, MAC X311 Calculus I and STA X023 Introductory Statistics I.

\*All course materials can be altered to fit the instructor's needs with regard to statewide Student Learning Objectives (SLOs) and any additional institutional SLOs that go above the statewide SLOs.

# Commitment

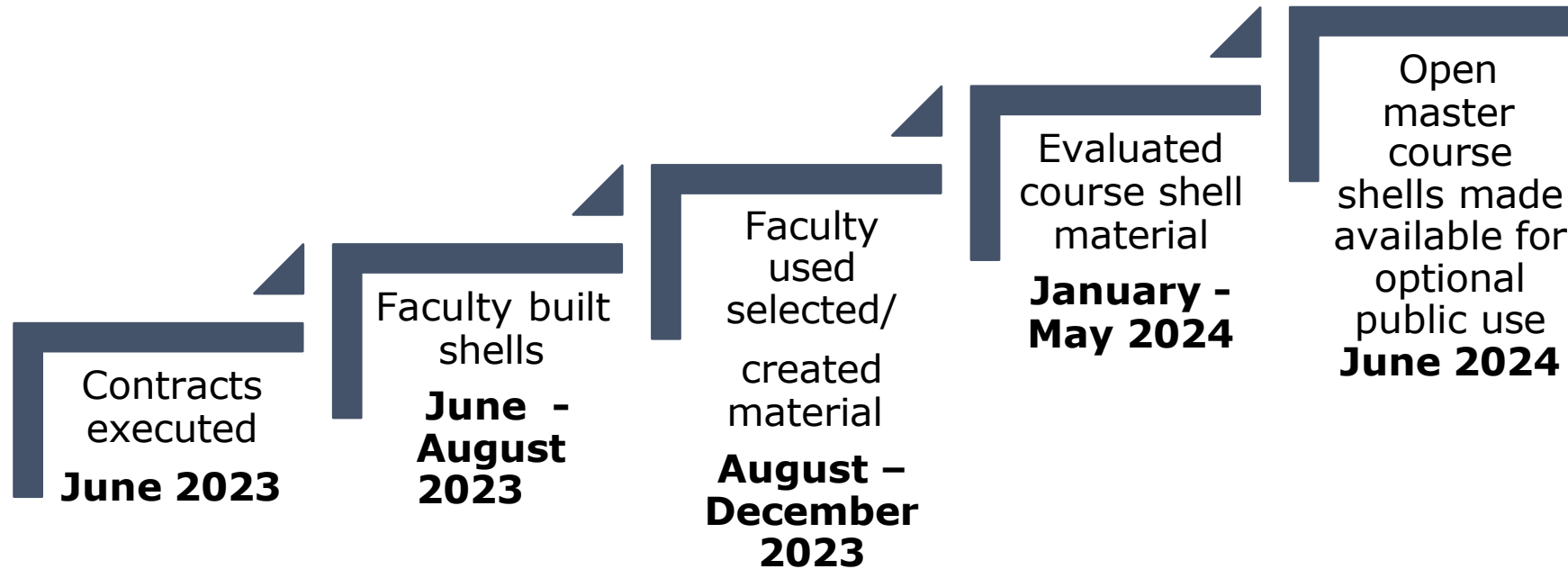
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Instructors were tasked with:

- **Collaborating** with subject matter experts **on course content development** and revision.
- **Creating** learning materials for new courses and/or analyzing, **updating and refining learning materials** for existing courses.
- **Creating engaging exercises** and learning activities **that optimize** online learning.
- Visualizing the user interface, and **creating visual, audio, and interactive learning tools** as appropriate.
- **Ensuring compliance with state and federal laws, statutes, and rules.**
- Designing assessments to **ensure students are learning.**
- Preparing to **publicly share** any **course materials** developed through the grant under a Creative Commons license.
- Using only grantee-authored, Creative Commons licensed, or public domain works when selecting instructional materials.
- Including syllabi outline, course instructional materials, activities and assessments.

# Math Course Shell Grant Timeline

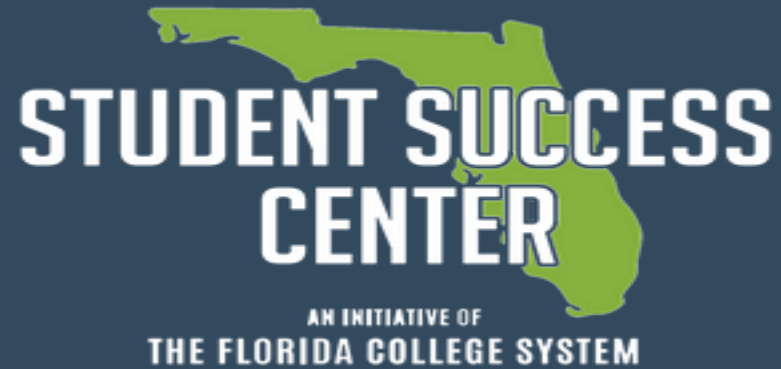
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## Math Course Shell Grant Awards

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<b>Institution</b>	<b>Course Shell Subjects</b>
Miami Dade College	MAC 2311 and STA 2023
Polk State College	MGF 1130
Tallahassee Community College	MAC 1105 with Corequisite Adaptations
Florida State University	MGF 1130 and MGF 1131



# Math Pathways Course Shells at Polk State College

Dr. Mike Long  
Professor – Mathematics  
Polk State College - Lakeland



# Implementing Open Educational Resources at Polk State College

*We are Polk.*<sup>TM</sup>

# Objective and Guiding Principles

Objective: Create a statewide course shell for all state colleges and universities.

The course and materials would

- build on the work that has been done thus far across the state of Florida,
- contain materials for both instructors and students,
- contain a broad range of topics so that it can be tailored to the curriculum of each college or university,
- utilize technology that traditional liberal arts math classes didn't use,
- would be easily accessible and free.





# Development Team

- The development team consisted of three math faculty with extensive experience in
  - Course development,
  - Utilizing open educational resources (OERs), and
  - Engagement in activities to improve teaching and learning.
- College-wide faculty representation ensured that the materials created could be immediately piloted on both campuses to reach a larger and more wide-ranging audience.



# Course Design

## Getting Started

- Course Homepage
- Instructions for Starting the Course
- Sample Syllabus
- Suggested Schedule
- Student Learning Guide
- Instructor Support

## Learning Modules

- Unit Overview
- Unit Objectives
- Section Learning Objectives
- Video and Written Content
- Activities
- Summative Assessments
- Module Formative Assessment

## Course Assessment

- Cumulative Assessment
- Student Feedback Survey
- Instructor Feedback



# Constructing the Course

- The team started with the course description for MGF 1130 from the Statewide Course Numbering System (SCNS).
- Using those guidelines, they built out broad objectives and then more detailed objectives.
- From those objectives, course elements (assignments, assessments, student support, etc.) were added to the course.
- Instructor resources and active learning were incorporated into each module.



- Home
- Syllabus
- Modules
- Grades
- People

## Mathematical Thinking Sample Course <sup>▲</sup>

**MATHEMATICAL  
THINKING**



SYLLABUS

SCHEDULE

MODULES

MYOPENMATH

### Contact Information:

Instructor:

Email:

Phone:

### Technical Support:

[Insert technical support information here.]

# Canvas Shell

- Home
- Syllabus
- Modules
- Grades
- People

## Course Syllabus <sup>▲</sup>

Note to the instructor: The following syllabus is a template. It uses a heading a paragraph structure so that it is compatible with screen readers. This note should be deleted before publishing.

### MGF x130: Mathematical Thinking

Term | Session | Modality

#### Instructor Information

Name:

Email:

Office:

Office Hours:

#### **Communication Expectations:**

The best method for contacting me is [preferred method of contact]. I will attempt to respond to any emails, questions, or concerns within 48 hours excluding weekends and holidays. If you do not receive a response during this timeframe, you may politely send another email.

When sending an email, please identify your name, the course, and the reference number so that I know which course you are enrolled in.

#### Course Information:

# OER Shell

**Entering Answers in My Open Math**  
Available Mon 9/11/23, 7:00 am until Fri 9/15/23, 11:59 pm

**Remote Proctoring Practice Test**  
Available Mon 9/11/23, 7:00 am until Fri 9/15/23, 11:59 pm

**Instructor Resources**  
Currently Hidden. Showing Expanded Fri 9/8/23, 7:00 am to Fri 9/15/23, 11:59 pm

Add An Item...

**Course Overview**  
Showing Fri 9/8/23, 7:00 am until Fri 9/15/23, 11:59 pm

This course is designed to help Florida public institutions as they implement MGF x130 Mathematical Thinking. MGF x130 was introduced into the general education core in conjunction with Florida Statute Section 1007.23(3) which requires the statewide articulation agreement to establish three mathematics pathways for students by aligning mathematics courses to programs, meta-majors, and careers. Public postsecondary institutions in Florida are required to align associate and baccalaureate degree program requirements to one of the three mathematics pathways identified on the Mathematics Pathways List for the 2024-25 academic year.

MGF x130 Mathematical Thinking course content was developed using a series of surveys in which stakeholders were asked what mathematical content was relevant for programs of study, meta-majors, and careers. Using these results and the information in the Statewide Course Numbering System (SCNS), course modules were developed. The course is designed to be modified for different modalities. For example, in a face-to-face class, you may want to hide the module tests and use them to create in-class assessments. In each module, there are formative and summative assessments, instructional content, and activities. A series of shorter, in-class introductory activities have been created. There are also longer projects that could be used for an entire class period or an out-of-class assignment.

**Student Registration**  
Hidden

Student Registration

- [YouTube Tutorial](#) [+]
- [New Student Signup](#)
- [Registering](#)

**MyOpenMath Support and FAQs**  
Hidden

Many questions about MyOpenMath can be answered through the discussions on the platform as well as the following sites:

- <https://www.myopenmath.com/help>
- <https://www.myopenmath.com/wikis/viewwiki.php?cid=1&id=4218>

Add An Item...

**Activities**  
Hidden

nyOpenMath Home | My Classes | User Settings | Log Out Polk MGFx130 Development

Course Messages Forums Calendar Gradebook Polk MGFx130 Development

Home > MGF 1130 Mathematical Thinking Shell Polk MGFx130 Development

MGF 1130 Mathematical Thinking Shell View: Instructor Student Quick Rearrange

Messages Forums Calendar Course Map Gradebook Log Out Help Using MyOpenMath

**Course Information**

MGF x130 - Mathematical Thinking

Course Description:

Through this course, students will utilize multiple means of problem-solving through student-centered mathematical exploration. The course is designed to teach students to think more effectively and vastly increase their problem-solving ability through practical application and divergent thinking. This course is appropriate for students in a wide range of disciplines/programs.

Learning Outcomes:

- Students will determine efficient means of solving a problem through investigation of multiple mathematical models.
- Students will apply logic in contextual situations to formulate and determine the validity of logical statements using a variety of methods.
- Students will apply mathematical concepts visually and contextually to represent, interpret, and reason about geometric figures.
- Students will recognize the characteristics of numbers and utilize numbers along with their operations appropriately in context.
- Students will analyze and interpret representations of data to draw reasonable conclusion.

**Scientific Calculator**

This free scientific calculator is suggested for our assignments.

- ▶ Unit 1 - Logic with a Sets Prelude Isolat
- ▶ Unit 2 - Number Theory Isolat
- ▶ Unit 3 - Measurement Isolat
- ▶ Unit 4 - Geometry Isolat
- ▶ Unit 5 - Basics of Statistics Isolat
- ▼ Final Exam Isolat

# Active Learning

- Research shows that when students engage actively with the content they are able to recall it, but more importantly, understand it.
- Active learning tasks of varying lengths and difficulty were incorporated.
- These activities can be modified for every modality.



# Implementing Three Math Pathways

- Developing the OER was one piece of a larger initiative to implement three math pathways that are tied to programs and careers.
- The math department visited each workforce program to explain the purpose behind the implementation and helped them select the math courses that are best suited for each program.
- They also met with Student Success Advisors, Student Success Coaches and the Registrar's Office to share updates on the implementation and develop related policies.

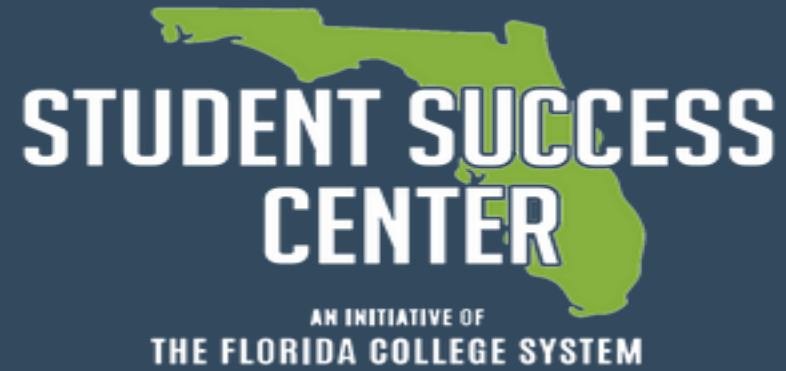


# Next Steps

- Fully implement three new math pathways in Fall 2024.
- Stakeholder feedback and enrollment trends will impact department activities within the next year.
- Explore other opportunities to improve student success in mathematics courses.
  - Increase the number of classes that utilize OER
  - Revisit developmental math course offerings
  - Improve and increase messaging to help students select the appropriate math pathway
  - Continue to partner with advisors and program directors







# Accessing Materials

# Contact Information

## Florida Student Success Center

Kiaira McCoy, Director

[flstudentsuccess@fldoe.org](mailto:flstudentsuccess@fldoe.org)