

Mathematics Modeling and Reasoning Course Pilot Course Description

Target Student: A student who may go to college or take a College Credit Plus course but is not yet academically ready from a mathematical perspective. *Note: Although the course most likely will consist of seniors, juniors may take the course.*

Description of Course This course is designed to promote reasoning, problem-solving and modeling through thematic units focused on mathematical practices while reinforcing and extending content in Number and Quantity, Algebra, Functions, Statistics and Probability, and Geometry. It is a yearlong course taught using student-centered pedagogy.

Course Pathways

The pilot will be a yearlong course. The pilot will explore multiple pathways for the future, such as the following:

- A one-credit course;
- A one-semester (half-credit) course followed by a College Credit Plus (CCP) course; and
- A one-credit course followed by a College Credit Plus (CCP) course.

Student Eligibility

Students are required to have completed the following:

- At least three units of credit of mathematics, including one unit of Algebra 2 or Math 3 or its equivalent; and
- Algebra and Geometry end-of-course state tests or Math 1 and Math 2 end-of-course state tests.

This course would be especially appropriate for students with the following characteristics:

- Anticipated college enrollment or viewed as having college potential;
- Not intending to pursue a pathway requiring calculus or not ready for a pre-calculus course;
- Not ready or eligible for College Credit Plus (CCP) classes;
- Scored basic and/or proficient across the two end-of-course state tests in mathematics;
- Scored between 16 and 21 on the ACT or scored between 460 and 520 on the SAT; and
- Received a WorkKeys score of at least 13 and on the way to earning an industry-recognized credential(s) worth 12 credential points.
- On the way to earning a total score of proficient or better on all career-technical exams or test modules.

Professional Learning

It is imperative that teachers who teach this course participate in the accompanying professional learning opportunities. These include face-to-face meetings and virtual hangouts. Piloting teachers will attend a multi-day professional learning session in the summer preceding the pilot focused on quantitative reasoning and modeling. Administrators will have an informational meeting at the same time. Piloting teachers are expected to participate in the following professional learning opportunities throughout the school year:

- Weekly online meetings for August and September;
- Bi-weekly online meetings in October and November;
- A face-to-face meeting in January
- Monthly online meetings from February to May;
- End-of-year face-to-face meeting to reflect on the year; and
- Ongoing collaboration with higher education faculty as needed.

Data Collection and Evaluation

Schools/districts participating in the pilot will be expected to collect data on their students. Specifics are still being determined but may include evaluation tools such as ACT/SAT scores, pre- and post-growth mindset tests, pre- and post-quantitative reasoning tests and/or student reflection statements. Pilot teachers also may be required to provide documentation that they implemented the lessons that were created by the planning group with fidelity. In addition, there may be people such as higher education collaborators, peer mentors, Ohio Department of Education staff, members of the research team and/or others interested in the pilot course periodically visiting the classrooms to observe the lessons.

Overall Timeline

- Spring/summer 2018
 - *Begin development of the course.*
- 2018-2019 school year
 - *Implement developmental pre-pilot where the pre-pilot teacher provides feedback and creates materials to help flesh out and refine the course.*
- 2019-2020 school year
 - *Implement full pilot.*
- 2020-2021 school year
 - *Launch course Phase 1.*
- 2021-2022 school year
 - *Launch course Phase 2.*

Policy Environment

It is strongly recommended this course be offered as a one credit math course that could either be taken during the junior or senior year of high school to help students who desire to go to college become remediation-free in mathematics. A full mathematics credit should be granted to a student successfully completing this course. This course satisfies a credit toward mathematics' graduation requirements.

An example description of the course for a district course book:

Prerequisite: Algebra 2 or its equivalent

Time frame: One year

Grades: 11-12

Credit: 1.0

This course is designed to promote reasoning, problem-solving and modeling through thematic units focused on mathematical practices while reinforcing and extending content in Number and Quantity, Algebra, Functions, Statistics and Probability, and Geometry. Quantitative reasoning and modeling involve the application of mathematics to real-world situations, with careful attention to the choice of units and contextual challenges. Problem-solving requires analyzing an unfamiliar situation and devising a solution strategy. Problem-solving and modeling together provide opportunities for students to experience success with mathematics, not merely improve their self-perception. These habits and skills promote perseverance and cut across disciplines, thus providing a gateway into successful postsecondary education and a variety of careers.

EMIS code guidance:

Use the following:

- 111850 Transition to College Mathematics;
- 111350 Modeling and Quantitative Reasoning; or
- Any other appropriate existing district-level EMIS code.