Kent Core Learning Outcomes Assessment Plan

Course number, title (credit hours): MATH 11010 Algebra for Calculus (3) and MATH 10775 Algebra for Calculus (4) and MATH 10675 Algebra for Calculus Boost (5)

Department/School: Mathematical Sciences

Proposed Kent Core Category: (please check appropriate box)

- ☐ Composition
- X Mathematics and Critical Reasoning
- ☐ Humanities and Fine Arts
  - ☐ Humanities
  - ☐ Fine Arts
- ☐ Social Sciences
- ☐ Basic Sciences
- ☐ Additional

A sample syllabus must accompany the plan.

I. Kent Core learning objectives	**II. Ohio Transfer Module learning objectives**	**III. What corresponding learning outcomes are included in this course?**	**IV. What method(s) will be used to assess student learning?**	**V. What evidence of this assessment will be presented annually for the five-year Kent Core review of this course?**
Acquire critical thinking and problem solving skills	Analyze functions. Routine analysis includes discussion of domain, range, zeros, general function behavior (increasing, decreasing, extrema, etc.). In addition to showing procedural fluency, the student can articulate reasons for choosing a particular process, recognize function families and anticipate behavior, and explain the implementation of a process Recognize function families as they appear in equations and inequalities and choose an appropriate solution methodology for a particular equation or inequality and can communicate reasons for that choice. Demonstrate an understanding of the correspondence between the solution to an equation, the zero of a function, and the point of intersection of two curves. Purposefully create equivalencies and indicate when they are valid.	Analyze functions. Routine analysis includes discussion of domain, range, zeros, general function behavior (increasing, decreasing, extrema, etc.). In addition to showing procedural fluency, the student can articulate reasons for choosing a particular process, recognize function families and anticipate behavior, and explain the implementation of a process. Recognize function families as they appear in equations and inequalities and choose an appropriate solution methodology for a particular equation or inequality and can communicate reasons for that choice. Demonstrate an understanding of the correspondence between the solution to an equation, the zero of a function, and the point of intersection of two curves. Purposefully create equivalencies and indicate when they are valid.	Homework assignments; Performance on in-class activities; Quizzes and exams; Common set of 10 – 15 questions administered as part of the final exam assessing student mastery of key concepts. Kent campus sections will administer the Pre-Calculus Concept assessment, a validated instrument to assess student readiness for Calculus. We will administer this as a pre- and post-test to assess growth of student learning.	Overall student grades will be monitored to track student performance in the course. We will report percentages of students mastering course material in general, i.e. the overall percentage of students scoring 73% or higher on the exam. In addition, we will report mastery of individual learning outcomes based on final exam items. Kent campus sections will administer the Pre-Calculus Concept assessment, a validated instrument to assess student readiness for Calculus. We will administer this as a pre- and post-test to assess growth of student learning and report average growth scores.

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	Recognize opportunities to create equivalencies in order to simplify workflow. Determine parameters of a model given the form of the model and data. Determine a reasonable applied domain for the model as well as articulate the limitations of the model. Anticipate the output from a graphing utility and make adjustments, as needed, in order to efficiently use the technology to solve a problem. Use technology to verify solutions to equations and inequalities which are difficult to obtain algebraically and know the difference between approximate and exact solutions. Use technology and algebra in concert to locate and identify exact solutions. Recognize when a result is applicable and use the result to make sound logical conclusions and provide counter-examples to conjectures.	Recognize opportunities to create equivalencies in order to simplify workflow. Determine parameters of a model given the form of the model and data. Determine a reasonable applied domain for the model as well as articulate the limitations of the model. Anticipate the output from a graphing utility and make adjustments, as needed, in order to efficiently use the technology to solve a problem. Use technology to verify solutions to equations and inequalities which are difficult to obtain algebraically and know the difference between approximate and exact solutions. Use technology and algebra in concert to locate and identify exact solutions. Recognize when a result is applicable and use the result to make sound logical conclusions and provide counter-examples to conjectures.		
Apply principles of effective written and oral communication				
Broaden their imagination and develop their creativity				

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Cultivate their natural curiosity and begin a lifelong pursuit of knowledge				
Develop competencies and values vital to responsible uses of information and technology				
Engage in independent thinking, develop their own voice and vision, and become informed, responsible citizens				
Improve their understanding of issues and behaviors concerning inclusion, community and tolerance				
Increase their awareness of ethical implications of their own and others' actions				
Integrate their major studies into the broader context of a liberal education				
Strengthen quantitative reasoning skills		Review intermediate algebra skills necessary to succeed in the course	Students will take a mastery 20-question Gateway Exam on intermediate algebra skills. No partial credit is given on the exam. Students who score 17 or better will earn 100 points. Students who take the exam at least three times and still do not earn a grade of 17 or	Overall student grades will be monitored to track student performance in the course. We will report percentages of students mastering course material in general, i.e. the overall percentage of students scoring 73% or higher on the exam. In

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			higher will earn a percent score, based on the number correct. Homework assignments; Performance on in-class activities; Quizzes and exams; Common set of 10 – 15 questions administered as part of the final exam assessing student mastery of key concepts.	addition, we will report mastery of individual learning outcomes based on final exam items.
	Recognize function families as they appear in equations and inequalities and choose an appropriate solution methodology for a particular equation or inequality and can communicate reasons for that choice. Demonstrate an understanding of the correspondence between the solution to an equation, the zero of a function, and the point of intersection of two curves. Purposefully create equivalencies and indicate when they are valid. Recognize opportunities to create equivalencies in order to simplify workflow. Interpret the function correspondence and behavior of a given model in terms of the context of the model. Create linear models from data and interpret slope as rate of change. Determine parameters of a model given the form of the model and data. Determine a reasonable applied domain for the model as well as articulate the limitations of the model. Recognize when a result is applicable	Recognize function families as they appear in equations and inequalities and choose an appropriate solution methodology for a particular equation or inequality and can communicate reasons for that choice. Demonstrate an understanding of the correspondence between the solution to an equation, the zero of a function, and the point of intersection of two curves. Purposefully create equivalencies and indicate when they are valid. Recognize opportunities to create equivalencies in order to simplify workflow. Interpret the function correspondence and behavior of a given model in terms of the context of the model. Create linear models from data and interpret slope as rate of change. Determine parameters of a model given the form of the model and data. Determine a reasonable applied domain for the model as well as articulate the limitations of the model. Recognize when a result is applicable		

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	and use the result to make sound logical conclusions and provide counter-examples to conjectures.	and use the result to make sound logical conclusions and provide counter-examples to conjectures.		
Understand basic concepts of the academic discipline	Analyze functions. Routine analysis includes discussion of domain, range, zeros, general function behavior (increasing, decreasing, extrema, etc.). In addition to showing procedural fluency, the student can articulate reasons for choosing a particular process, recognize function families and anticipate behavior, and explain the implementation of a process Convert between different representations of a function. Perform operations with functions including addition, subtraction, multiplication, division, composition, and inversion. Recognize function families as they appear in equations and inequalities and choose an appropriate solution methodology for a particular equation or inequality and can communicate reasons for that choice. Demonstrate an understanding of the correspondence between the solution to an equation, the zero of a function, and the point of intersection of two curves. Use correct, consistent, and coherent notation throughout the solution process	Analyze functions. Routine analysis includes discussion of domain, range, zeros, general function behavior (increasing, decreasing, extrema, etc.). In addition to showing procedural fluency, the student can articulate reasons for choosing a particular process, recognize function families and anticipate behavior, and explain the implementation of a process Convert between different representations of a function. Perform operations with functions including addition, subtraction, multiplication, division, composition, and inversion. Recognize function families as they appear in equations and inequalities and choose an appropriate solution methodology for a particular equation or inequality and can communicate reasons for that choice. Demonstrate an understanding of the correspondence between the solution to an equation, the zero of a function, and the point of intersection of two curves. Use correct, consistent, and coherent notation throughout the solution process	Homework assignments; Performance on in-class activities; Quizzes and exams; Common set of 10 – 15 questions administered as part of the final exam assessing student mastery of key concepts. Kent campus sections will administer the Pre-Calculus Concept assessment, a validated instrument to assess student readiness for Calculus. We will administer this as a pre- and post-test to assess growth of student learning.	Overall student grades will be monitored to track student performance in the course. We will report percentages of students mastering course material in general, i.e. the overall percentage of students scoring 73% or higher on the exam. In addition, we will report mastery of individual learning outcomes based on final exam items. Kent campus sections will administer the Pre-Calculus Concept assessment, a validated instrument to assess student readiness for Calculus. We will administer this as a pre- and post-test to assess growth of student learning and report average growth scores.

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	to a given equation or inequality. Distinguish between exact and approximate solutions and which methods results in which kind of solutions. Solve for one variable in terms of another. Solve systems of equations using substitution or elimination.	to a given equation or inequality. Distinguish between exact and approximate solutions and which methods results in which kind of solutions. Solve for one variable in terms of another. Solve systems of equations using substitution or elimination.		

Please note:

We will use the final exam to assess strengths and weakness in our students and analyze causes of the weakness and adjust course materials, delivery, or assignments as deemed appropriate.
A separate entity, perhaps a subcommittee of the USC, will collect, compile, and analyze the data, returning it to course coordinators and the chair of the USC. Data will be requested during final exam week and the compilation will be completed before the first week of the subsequent semester.

ASSURANCES:

By submitting this proposal, we assure that:

1. The faculty members who teach this course have agreed to the learning outcomes and assessment methods.
2. Assessment results will be reviewed annually by the faculty and submitted to the University Requirements Curriculum Committee.
3. Modifications to the course and/or assessment plan will be based on the annual review.

Department Chair/School Director (or designee) Signature Date