

**Core Curriculum Course Submission
Criteria: Math**

1. General Information

a. Originating Person	b. Contact Person's E-mail	c. Contact Phone	d. Date
Rebecca Streett	rastreett@ualr.edu	(501)569-8100	9-22-2014
e. College/School	f. Department/Program		
College of Arts, Letters, & Sciences	Mathematics and Statistics		

Submission Statement
 By submitting this form, we acknowledge our understanding that the Core Council has the authority to review approved courses to ensure they continue to meet the established goals and outcomes of that category of the core; that the Council has authority to develop a core assessment program; and that the Council will be developing review and assessment policies by the end of 2014. Further, we agree that if this course is approved, we will participate in the university-wide assessment of the core.

Chair and Dean Awareness
 A separate statement from the chair must be included that states that the department faculty have approved this course for submission to the core and that the chair takes responsibility for informing the Dean about the submission of the course.

2. Course Information

a. Course ID	b. Current Title
MATH 1401	Pre-Calculus

c. Catalog Description
 Prerequisite: ACT Math score of 24 or other suitable score on our mathematics placement test. The course includes concepts in algebra and trigonometry that are directly applicable to success in calculus such as functions, equations, trigonometric identities, systems of equations and conic sections. MATH 1401 may serve in place of Math 1302 and MATH 1303 as a prerequisite for MATH 1451 or MATH 1311 or MATH 1342. Only one of Math 1302 or Math 1401 may be counted for degree credit. Four lecture hours. Four credit hours. (ACTS Course Number MATH 1305)

d. How will your department ensure a level of consistency among sections of this course? Who will be responsible for this?
 The Chair collects and reviews all syllabi for consistency of learning objectives. New faculty, adjunct faculty, and teaching assistants are given sample syllabi for the courses they teach. Chair and peer review committee are responsible for ensuring consistency among all sections of Pre-Calculus. All sections of Pre-Calculus use a mandatory online homework/quiz delivery system.

Educational Goals	Learning Outcomes students will	Learning Objectives: At the end of the course students will be able to	Assignments	Explanation
	1. understand mathematical relationships among quantities;	Learning Objectives 1.1 define and identify a function, and classify if a relationship represents a function or not based on a graph, a set of ordered pairs, a mapping or an equation; analyze the relationships between the graphs of many different functions with respect to their symmetry, translations, asymptotes, domain, range, intervals of increase/ decrease/constant, x and y intercepts.	Assignments 1.1 Class discussions, homework, quizzes, and exam.	Explanation 1.1 The learning objectives will be accomplished via in-class problem solving and discussion (online Q&A discussion boards) and will be assessed via online homework assignments, tests, quizzes and the final exam.
	2. understand fundamental mathematical/algebraic operations;	Learning Objectives 1.2	Assignments 1.2	Explanation 1.2

Knowledge
 1 –Concepts, methodologies, findings, and applications of mathematics and the social and natural sciences, engineering and technology.

find and interpret function values obtained for any defined function such as piece-wise defined functions, quadratic functions, linear functions, cubic functions, logarithmic functions, exponential functions, rational functions, polynomial functions, trigonometric functions, and conic sections; apply algebraic operations such as addition/subtraction, multiplication/division, long division and synthetic division, and composition on different sets of functions including quadratic functions, linear functions, cubic functions, logarithmic functions, exponential functions, rational functions, polynomial functions, trigonometric functions, and conic sections; apply algebraic operations to the concept of a matrix in order to determine sums, differences, products, inverses and determinants.

Class discussions, homework, quizzes, and exam.

The learning objectives will be accomplished via in-class problem solving and discussion (online Q&A discussion boards) and will be assessed via online homework assignments, tests, quizzes and the final exam.

Educational Goals	Learning Outcomes students will	Learning Objectives: At the end of the course students will be able to	Assignments	Explanation
	1. use basic mathematical formulas and terminology:	Learning Objectives 1.1	Assignments 1.1	Explanation 1.1

solve problems involving the usage of the formulas for compound interest, difference quotient, average rate of change, and change of base; represent exponential functions in logarithm form and vice versa; apply the properties of logarithms to solve exponential and logarithmic equations; use the definition and properties of quadratics to graph a quadratic function; determine if a function has an inverse and find the inverse function, if it exists; use the theorems associated with polynomial functions to find real and complex zeros; solve systems of equations in two and three variables using matrices; use trigonometric theorems to solve equations; analyze right-triangles and oblique triangles using Pythagorean Theorem, trigonometric identities, the Law of Sines, and the Law of Cosines; verify trigonometric identities.

Class discussions, homework, quizzes, and exam.

The learning objectives will be accomplished via in-class problem solving and discussion (online Q&A discussion boards) and will be assessed via online homework assignments, tests, quizzes and the final exam.

<p>2. explain orally and in writing the mathematical “reasonableness” of a statement that is presented as being implied by data</p>	<p>Learning Objectives 1.2 explain why an obtained answer may not make sense in a given application problem; use estimation skills to determine the reasonableness of an answer obtained when solving equations (logarithm, exponential, and trigonometric) and application problems.</p>	<p>Assignments 1.2 Class discussions, homework, quizzes, and exam.</p>	<p>Explanation 1.2 The learning objectives will be accomplished via in-class problem solving and discussion (online Q&A discussion boards) and will be assessed via online homework assignments, tests, quizzes and the final exam.</p>

	3. communicate about math precisely orally and in writing	Learning Objectives 1.3 communicate, orally and in writing, their solutions to problems or their procedures for solving problems.	Assignments 1.3 Class discussions, homework, quizzes, and exam.	Explanation 1.3 The learning objectives will be accomplished via in-class problem solving and discussion (online Q&A discussion boards) and will be assessed via online homework assignments, tests, quizzes and the final exam.
Educational Goals	Learning Outcomes students will	Learning Objectives: At the end of the course students will be able to	Assignments	Explanation
	1. interpret, analyze, and identify appropriate applied math models, data and graphs;	Learning Objectives 2.1	Assignments 2.1	Explanation 2.1

Skills 2 - Critical Thinking.

	<p>analyze polynomial functions using the following theorems: Remainder, Factor, Rational Zeros and The Fundamental Theorem of Algebra; explain the characteristics of rational functions and their asymptotic behavior; interpret and analyze graphs and mathematical models based on important characteristics such as shape, parent function, transformations, symmetry, asymptotes, initial conditions; explain the end behavior of a polynomial function; model exponential growth and exponential decay; analyze trigonometric functions using the Law of Sines and the Law of Cosines.</p>	<p>Class discussions, homework, quizzes, and exam.</p>	<p>The learning objectives will be accomplished via in-class problem solving and discussion (online Q&A discussion boards) and will be assessed via online homework assignments, tests, quizzes and the final exam.</p>
<p>2. develop abstract and quantitative reasoning ability;</p>	<p>Learning Objectives 2.2</p>	<p>Assignments 2.2</p>	<p>Explanation 2.2</p>

make predictions regarding any general function based on their understanding of functions and the operations on functions; estimate and check answers to the mathematical problems encountered in the course in order to determine reasonableness, identify alternatives, and select optimal results; understand how real-world problems and social issues can be analyzed using the power and rigor of mathematical models.

Class discussions, homework, quizzes, and exam.

The learning objectives will be accomplished via in-class problem solving and discussion (online Q&A discussion boards) and will be assessed via online homework assignments, tests, quizzes and the final exam.

Educational Goals	Learning Outcomes students will	Learning Objectives: At the end of the course students will be able to	Assignments	Explanation
Skills 3 – Information Technology	1. make appropriate decisions regarding the use of technology when solving problems, recognizing both the insight to be gained and the limitation;	Learning Objectives 3.1 effectively use a graphing calculator to work with matrices and to analyze the graphs of functions and systems of equations; determine when the use of the technology is appropriate and when it is not.	Assignments 3.1 Class discussions, homework, quizzes, and exam.	Explanation 3.1 The learning objectives will be accomplished via in-class problem solving where instructors share their strategies and insights on proper use of the technology (online Q&A discussion boards) and will be assessed via online homework assignments, tests, quizzes and the final exam.
	2. use information resources like the internet reflectively for inquiry, exploration, and communication;	Learning Objectives 3.1 use the internet to communicate via email, and as a resource for supplemental explanations.	Assignments 3.1 Online homework and quizzes.	Explanation 3.1 This learning objective will be accomplished via the internet. Students are encouraged to seek alternate explanations via the internet. Instructors may communicate with students via email at any time during the semester.
Educational Goals	Learning Outcomes students will	Learning Objectives: At the end of the course students will be able to	Assignments	Explanation
Values 1 – Personal Responsibility and Ethical Behavior	1. take responsibility for completing assignments in an honest and ethical manner, working on their own when required and acknowledging resources when used;	Learning Objectives 1.1 understand the importance of following the UALR policies on academic integrity.	Assignments 1.1 Proctored exams.	Explanation 1.1 Throughout the semester, students are reminded of the importance of following the UALR, departmental and course (stated on the syllabus) policies of academic dishonesty to accomplish this objective.
	2. understand the duty to be precise and accurate with data;	Learning Objectives 1.2	Assignments 1.2	Explanation 1.2

		understand that precision and accuracy are critical components of interpreting data and solving problems correctly, and will be precise and accurate when communicating to others the conclusions of their results.	Class discussions, homework, quizzes, and exam.	The learning objectives will be accomplished via in-class problem solving where instructors share their strategies and insights on proper use of the technology (online Q&A discussion boards) and will be assessed via online homework assignments, tests, quizzes and the final exam.
Educational Goals	Learning Outcomes students will	Learning Objectives: At the end of the course students will be able to	Assignments	Explanation
Value 3-Global and cultural Understanding	1. analyze "real world" implications and develop mathematical models that aid in the understanding of current global issues.	Learning Objectives 3.1 understand how real-world problems and social issues can be analyzed using the power and rigor of mathematical models; recognize that many mathematical models will only work under a given set of initial conditions.	Assignments 3.1 Class discussions, homework, quizzes, and exam.	Explanation 3.1 The learning objectives will be accomplished via in-class problem solving and discussion (online Q&A discussion boards) and will be assessed via online homework assignments, tests, quizzes and the final exam.

Additional Comments:

Jhana M Thomas
Approved by Core Curriculum Committee

10/16/14
Date

[Signature]
Approved by Provost

10/17/14
Date


Approved by Chancellor

10-22-14
Date