

MATHEMATICAL SCIENCES
Institutional (ILO), Program (PLO), and Course (SLO) Alignment

Program: Developmental Math	Number of Courses: 8	Date Updated: 02.26.2015	Submitted by: Susanne Bucher, ext. 3221
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ILOs	1. Critical Thinking <i>Students apply critical, creative and analytical skills to identify and solve problems, analyze information, synthesize and evaluate ideas, and transform existing ideas into new forms.</i>	2. Communication <i>Students effectively communicate with and respond to varied audiences in written, spoken or signed, and artistic forms.</i>	3. Community and Personal Development <i>Students are productive and engaged members of society, demonstrating personal responsibility, and community and social awareness through their engagement in campus programs and services.</i>	4. Information Literacy <i>Students determine an information need and use various media and formats to develop a research strategy and locate, evaluate, document, and use information to accomplish a specific purpose. Students demonstrate an understanding of the legal, social, and ethical aspects related to information use.</i>
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SLO-PLO-ILO ALIGNMENT NOTES:

Mark boxes with an 'X' if: SLO/PLO is a major focus or an important part of the course/program; direct instruction or some direct instruction is provided; students are evaluated multiple times (and possibly in various ways) throughout the course or are evaluated on the concepts once or twice within the course.

DO NOT mark with an 'X' if: SLO/PLO is a minor focus of the course/program and some instruction is given in the area but students are not formally evaluated on the concepts; or if the SLO/PLO is minimally or not at all part of the course/program.

PLOs	PLO to ILO Alignment <i>(Mark with an X)</i>			
	1	2	3	4
PLO #1 Solving Application Problems A students completing PreCollegiate Mathematics will recognize the underlying mathematical concepts in a given context (word problems, data, diagrams, etc.) and apply those concepts correctly.	X	X	X	
PLO #2 Solving Equations and Manipulating Expressions A student completing Pre-Collegiate Mathematics will demonstrate the ability to identify and correctly implement techniques to symbolically solve equations and manipulate expressions.	X			
PLO #3 Visual and Graphical Methods A student completing Pre-Collegiate Mathematics will use visual and graphical methods to represent and analyze information and to solve problems.	X	X		
PLO #4 Articulating Mathematical Reasoning A student completing Pre-Collegiate Mathematics will verbally articulate (orally or in writing) the mathematical reasoning they used to solve a problem or analyze a situation.	X	X		

SLOs	SLO to PLO Alignment <i>(Mark with an X)</i>				COURSE to ILO Alignment <i>*FOR OFFICE USE ONLY*</i>			
	P1	P2	P3	P4	1	2	3	4
MATH 12 Basic Arithmetic Skills: SLO #1 Application Problems Students will be able to recognize addition, subtraction, multiplication, division, exponentiation, factoring and order of operations in a given context (word problem, data, diagram, etc.) involving non-negative real numbers to write corresponding mathematical expressions and solve authentic, real-world application problems.	X				X			
MATH 12 Basic Arithmetic Skills: SLO #2 Solving Equations and Manipulating Expressions Students will be able to use numerical and symbolic representations to correctly perform operations (addition, subtraction, multiplication, division, exponentiation, factoring, and order of operations) on non-negative real numbers to simplify expressions.		X						
MATH 12 Basic Arithmetic Skills: SLO #3 Visual and Graphical Methods A student completing Pre-Collegiate mathematics will use visual and graphical methods to represent and analyze information and to solve problems using non negative real numbers, including demonstrating correct ordering of values and testing reasonableness of solutions.			X					
MATH 12 Basic Arithmetic Skills: SLO #4 Articulating Mathematical Reasoning A student completing Pre collegiate mathematics will verbally articulate (orally or in written form) the mathematical reasoning they used to solve a problem or analyze a situation.				X				
MATH 23 Pre-Algebra: SLO #1 Application Problems Students will recognize the underlying mathematical concepts in order to successfully evaluate expressions and formulas in a given context (word problems, data, diagrams, etc.) and apply those concepts correctly in authentic, real-world application problems.	X				X			
MATH 23 Pre-Algebra: SLO #2 Solving Equations and Manipulating Expressions Students will use numerical and symbolic representations of mathematical ideas to simplify linear expressions and solve linear equations.		X						
MATH 23 Pre-Algebra: SLO #3 Visual and Graphical Methods Students will be able to use visual or graphical methods to solve linear equations and problems involving geometry and measurement.			X					
MATH 23 Pre-Algebra: SLO #4 Articulating Mathematical Reasoning Students will verbally articulate (orally or in written form) the mathematical reasoning they used to solve a numeric or linear problem or analyze a numeric or linear situation.				X				

SLOs	SLO to PLO Alignment <i>(Mark with an X)</i>				COURSE to ILO Alignment <i>*FOR OFFICE USE ONLY*</i>			
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MATH 37 Basic Accelerated Mathematics: SLO #1 Application Problems A student will be able to recognize the underlying mathematical concepts, with an emphasis on linear relations, in a given context (word problems, data, diagrams, etc.) and apply those concepts correctly.	X				X			
MATH 37 Basic Accelerated Mathematics: SLO #2 Solving Equations and Manipulating Expressions A student will be able to demonstrate the ability to identify and correctly implement techniques to symbolically solve equations, with an emphasis on linear equations, and manipulate expressions.		X						
MATH 37 Basic Accelerated Mathematics: SLO #3 Visual and Graphical Methods A student will be able to use visual and graphical methods to represent and analyze information and to solve problems, with an emphasis on linear graphs.			X					
MATH 37 Basic Accelerated Mathematics: SLO #4 Articulating Mathematical Reasoning A student will be able to articulate orally or in written form the mathematical reasoning they used to solve a problem or analyze a situation.				X				
MATH 40 Elementary Algebra: SLO #1 Application Problems Students will be able to recognize linear and quadratic equations in a given context, and use mathematical reasoning and problem solving skills to solve authentic, real world application problems.	X				X			
MATH 40 Elementary Algebra: SLO #2 Solving Equations and Manipulating Expressions Students will be able to use numerical and symbolic representations of mathematical ideas to simplify or solve linear, quadratic, rational, and radical expressions or equations.		X						
MATH 40 Elementary Algebra: SLO #3 Visual and Graphical Methods Students will be able to use graphical methods to represent linear and quadratic relations as well as systems of linear relations and to find solutions to linear and quadratic equations, as well as solve systems of linear equations.			X					
MATH 40 Elementary Algebra: SLO #4 Articulating Mathematical Reasoning Students will be able to articulate the mathematical reasoning used in a variety of problems, orally or in writing.				X				
MATH 60 Elementary Geometry: SLO #1 Application Problems Students will be able to define geometric terms, polygons, and shapes and apply characteristics of the shapes to solve geometric problems.	X				X			
MATH 60 Elementary Geometry: SLO #2 Solving Equations and Manipulating Expressions Students will be able to calculate perimeter, area, surface area and volume for various 2D and 3D geometric shapes.		X						
MATH 60 Elementary Geometry: SLO #3 Visual and Graphical Methods Students will be able to construct geometric shapes using the compass and straightedge.			X					
MATH 60 Elementary Geometry: SLO #4 Articulating Mathematical Reasoning Students will be able to prove geometric conjectures and theorems using deductive logic.				X				

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MATH 67 General Education Algebra: SLO #1 Application Problems Students will be able to recognize and apply appropriate mathematical concepts and models involving a variety of functions to contextualized problems involving authentic, real-world data.	X				X			
MATH 67 General Education Algebra: SLO #2 Solving Equations and Manipulating Expressions Students will be able to symbolically (algebraically) solve a variety of equations, inequalities and linear systems and manipulate symbolic (algebraic) expressions that arise in contextualized problems using authentic, real-world data.		X						
MATH 67 General Education Algebra: SLO #3 Visual and Graphical Methods Students will use visual and graphical methods to represent, analyze and solve contextualized problems involving authentic, real-world data.			X					
MATH 67 General Education Algebra: SLO #4 Articulating Mathematical Reasoning Students will be able to articulate the mathematical reasoning used in solving a variety of contextualized problems using authentic, real-world data, orally or in writing.				X				
MATH 73 Intermediate Algebra for General Education: SLO #1 Application Problems Students will be able to recognize and apply appropriate mathematical concepts and models involving a variety of functions to contextualized problems (authentic, real-world applications).	X				X			
MATH 73 Intermediate Algebra for General Education: SLO #2 Solving Equations and Manipulating Expressions Students will be able to symbolically (algebraically) solve a variety of equations, inequalities and linear systems and manipulate symbolic (algebraic) expressions that arise in contextualized problems.		X						
MATH 73 Intermediate Algebra for General Education: SLO #3 Visual and Graphical Methods Students will use visual and graphical methods to represent, analyze and solve contextualized problems.			X					
MATH 73 Intermediate Algebra for General Education: SLO #4 Articulating Mathematical Reasoning Students will be able to articulate the mathematical reasoning used in solving a variety of contextualized problems, both orally and in writing.				X				

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MATH 80 Intermediate Algebra for Science, Technology, Engineering, and Mathematics: SLO #1 Application Problems Students will be able to solve application problems involving linear, quadratic, polynomial, rational, radical, exponential and logarithmic functions.	X				X			
MATH 80 Intermediate Algebra for Science, Technology, Engineering, and Mathematics: SLO #2 Solving Equations and Manipulating Expressions Students will be able to evaluate numerical operations and manipulate algebraic expressions involving rational and negative exponents, radicals, complex numbers, exponents and logarithms and be able to solve linear, quadratic, polynomial, rational, radical, absolute value, exponential and logarithmic equations and inequalities.		X						
MATH 80 Intermediate Algebra for Science, Technology, Engineering, and Mathematics: SLO #3 Visual and Graphical Methods Students will be able to use visual and graphical methods to represent, analyze and solve problem involving linear, quadratic, polynomial, rational, absolute value, radical, exponential, logarithmic functions, conic sections, linear and nonlinear systems of equations. Students will also be able to solve such functions and equations using graphical methods.			X					
MATH 80 Intermediate Algebra for Science, Technology, Engineering, and Mathematics: SLO #4 Articulating Mathematical Reasoning Students will be able to explain verbally, both orally or in writing, and the mathematical reasoning used in an application problem involving linear, quadratic, polynomial, rational, radical, absolute value, exponential and logarithmic equations and inequalities.				X				