

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

Program: Math (Math and Science Majors)	Number of Courses: 7	Date Updated: 09.21.2014	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 Understanding Concepts Students will explain and demonstrate mathematical concepts relevant to the course content.	X	X		X
PLO #2 Solving Problems Students will solve problems, including application problems, relevant to the course concepts and content.	X	X	X	X
PLO #3 Graphs Students will create, interpret and analyze graphs relevant to the course concepts and content.	X	X		X
PLO #4 Proofs Students will analyze and construct proofs relevant to the course concepts and content.	X	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 170 Trigonometry: SLO #1 Understanding Concepts Students will explain and demonstrate basic trigonometric concepts and definitions.	X				X			
MATH 170 Trigonometry: SLO #2 Solving Problems Students will solve trigonometric application problems, including those involving the laws of sines and cosines.	X	X						
MATH 170 Trigonometry: SLO #3 Graphs Students will create, interpret and analyze the graphs of trigonometric functions and their inverses.	X		X					
MATH 170 Trigonometry: SLO #4 Proofs Students will analyze and construct proofs of trigonometric identities.	X			X				
MATH 180 Pre-Calculus: SLO #1 Understanding Concepts Students will explain and demonstrate basic precalculus concepts by solving equations, inequalities and systems involving algebraic, exponential, logarithmic, trigonometric, and absolute value expressions.	X				X			
MATH 180 Pre-Calculus: SLO #2 Solving Problems Students will use polynomial, rational, exponential, logarithmic, and trigonometric equations and functions to set up and solve application and modeling problems.	X	X						
MATH 180 Pre-Calculus: SLO #3 Graphs Students will create, interpret and analyze the graphs of polynomial, rational, exponential, logarithmic, trigonometric, parametric, polar and conic equations.	X		X					
MATH 180 Pre-Calculus: SLO #4 Proofs Students will analyze and construct proofs, including proofs by induction.	X	X		X				
MATH 190 Single Variable Calculus and Analytical Geometry I: SLO #1 Understanding Concepts Students will explain and demonstrate the idea of the limit, the derivative and the integral.	X				X			
MATH 190 Single Variable Calculus and Analytical Geometry I: SLO #2 Solving Problems Solve problems, including problems involving velocity and acceleration, by using derivatives and integrals.	X	X						
MATH 190 Single Variable Calculus and Analytical Geometry I: SLO #3 Graphs Students will use techniques of calculus to determine maxima, minima, and points of inflection on the graph of a function.	X	X	X					
MATH 190 Single Variable Calculus and Analytical Geometry I: SLO #4 Proofs Students will analyze and construct proofs involving limits, derivatives, and integrals.	X	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 191 Single Variable Calculus and Analytical Geometry II: SLO #1 Understanding Concepts Students will explain and demonstrate advanced integration techniques and convergence of sequences and series.	X				X			
MATH 191 Single Variable Calculus and Analytical Geometry II: SLO #2 Solving Problems Students will use integrals to evaluate volumes, surface area and arc length.	X	X						
MATH 191 Single Variable Calculus and Analytical Geometry II: SLO #3 Graphs Students will use limits, derivatives and integration to analyze graphs of parametric equations, polar equations, and conic sections.	X	X	X					
MATH 191 Single Variable Calculus and Analytical Geometry II: SLO #4 Proofs Students will analyze and construct proofs to determine convergence and divergence of sequences and series.	X	X		X				
MATH 210 Introduction to Discrete Structures: SLO #1 Understanding Concepts Students will explain and demonstrate an understanding of the key principles of logic, number theory, combinatorics, probability and graph theory.	X				X			
MATH 210 Introduction to Discrete Structures: SLO #2 Solving Problems Students will use logic, functions, number theory, and combinatorics to solve a variety of problems, including application problems and computer science algorithm analysis.	X	X	X					
MATH 210 Introduction to Discrete Structures: SLO #3 Graphs Students will analyze and solve problems in graph theory.	X		X					
MATH 210 Introduction to Discrete Structures: SLO #4 Proofs Students will analyze and construct proofs in logic, number theory, combinatorics, probability and graph theory.	X	X	X	X				
MATH 220 Multi-Variable Calculus: SLO #1 Understanding Concepts Students will explain and demonstrate partial derivatives, multiple integrals and the major theorems of vector calculus.	X				X			
MATH 220 Multi-Variable Calculus: SLO #2 Solving Problems Students will calculate partial derivatives for a function of more than one variable and use them to solve multivariable optimization problems; and evaluate double and triple integrals, and apply them to physical problems such as moments and centers of mass.	X	X						
MATH 220 Multi-Variable Calculus: SLO #3 Graphs Students will analyze the graphs and equations of curves and surfaces in three-dimensional space, as well as vector fields.	X		X					
MATH 220 Multi-Variable Calculus: SLO #4 Proofs Students will analyze and apply Green's, Stokes, and Gauss' Theorems.	X	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 270 Differential Equations with Linear Algebra: SLO #1 Understanding Concepts Students will explain and demonstrate the key concepts of linear algebra, including determinants, vector spaces and linear transformations.	X				X			
MATH 270 Differential Equations with Linear Algebra: SLO #2 Solving Problems Students will use differential equations and linear algebra to solve a variety of problems, including application problems.	X	X						
MATH 270 Differential Equations with Linear Algebra: SLO #3 Graphs Students will use graphical techniques to solve differential equations or systems of differential equations.	X	X	X					
MATH 270 Differential Equations with Linear Algebra: SLO #4 Proofs Students will analyze and construct proofs relevant to differential equations and linear algebra.	X	X		X				