MATHEMATICS Program

ISLOs, PSLOs, CSLOs, Mapping, and Assessment Plan

			Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
			F 2013	S 2014	F 2014	S 2015	F 2015	S 2016	F 2016	S 2017	F 2017	S 2018	F 2018	S 2019
	INSTITUTIONAL STUDENT LEARNING OUTCOMES - ISLOs													
ISLO 1	**COMMUNICATION**													
1A	Read													
1B	Listen													
1C	Write													
1D	Dialogue													
ISLO 2	**TECHNOLOGY AND INFORMATION COMPETENCY**													
2A	Demonstrate Technical Literacy													
2B	Apply Technology													
2C	Access Information													
2D	Evaluate and Examine Information													
ISLO 3	**CRITICAL AND CREATIVE THINKING**													
3A	Inquire													
3B	Analyze													
3C	Problem Solve													
3D	Express													
ISLO 4	**CITIZENSHIP**													
4A	Ethics													
4B	Diversity													
4C	Sustainability/Global Awareness													
4D	Personal Responsibility													

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	MATHEMATICS PROGRAM OUTCOMES - PSLOs	**Related ISLOs**												
PSLO A	Use mathematical techniques to translate, model, and solve applied problems.	1A,1C,2B,2C,3A,3B,3C												
PSLO B	Differentiate between expressions and equations; and, using appropriate mathematical techniques, simplify expressions and solve equations.	1A,1C,2B,3B,3C												
PSLO C	Interpret and construct visual models of mathematical concepts.	1A,1C,2A,2B,2D,3A,3B,3C,3D												
PSLO D	Clearly communicate mathematical information, concepts, and processes to others.	1B,1C,1D,2A,2B,3A,3B												
PSLO E	Develop a growth mindset, math sophication, and confidence.	1B,1C,1D,2C,2D,3A,3B, 3C, 3D, 4D												
MATHEMATICS AS-T DEGREE - same as the PSLOs. **MATHEMATICS AA or AS DEGREE - same as the PSLOs.**														
	MATHEMATICS COURSE OUTCOMES - CSLOs	**Related PSLO**												
	MATH A - Elementary Alegebra		C- Completed, P- Planned											
CSLO 1	Simplify expressions and solve equations of the following types: linear, quadratic, rational, and radical.	B,C										P		
CSLO 2	Interpret and construct linear graphs.	A,C				C								
CSLO 3	Translate, model, and solve applied problems using linear, quadratic, rational, and radical equations.	A		C		C								
CSLO 4	Logically present clear, complete, accurate, and sufficiently detailed solutions to communicate reasoning and demonstrate the method of solving problems.	A,D												

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	MATH B - Plane Geometry													
CSLO 1	Logically present clear, complete, accurate, and sufficiently detailed solutions to communicate reasoning and demonstrate the method of solving problems.	D, E												
CSLO 2	Construct deductively valid proofs of theorems by using definitions, postulates, and previously proven theorems.	D, E				C							P	
CSLO 3	Using a compass and straightedge construct standard geometric figures: duplicated angle, duplicated line segment, angle bisector, perpendicular bisector, equilateral triangle, square, and the incenter, circumcenter, orthocenter, and centroid of a triangle.	A,C,D												
	MATH D - Intermediate Algebra													
CSLO 1	Simplify expressions and solve equations of the following types: linear, quadratic (including some with complex solutions), rational, radical, absolute value, exponential, and logarithmic.	B,C		C	C									
CSLO 2	Interpret and construct graphs of linear, quadratic, exponential, and logarithmic functions and their inverse functions.	A,C		C										P
CSLO 3	Translate, model, and solve applied problems using linear, quadratic, rational, radical, exponential, and logarithmic functions.	A			C									
CSLO 4	Logically present clear, complete, accurate, and sufficiently detailed solutions to communicate reasoning and demonstrate the method of solving problems.	A,D												
	MATH E - Practical Mathematics													
CSLO 1	Apply the concept of numeracy in multiple contexts.	A,D												
CSLO 2	Recognize proportional relationships and use proportional reasoning to solve problems.	A,B,C						C						
CSLO 3	Use algebra to recognize and write relationships involving variables; interpret those relationships and solve problems.	A,B												
CSLO 4	Apply basic right triangle trigonometry to analyze data, write equations and solve applied problems.	A,B,C												
CSLO 5	Analyze and interpret data critically in multiple formats including graphs, tables, equations, formulas and words.	A,B,C,D												
CSLO 6	Develop the ability to think critically and confidently solve problems in a variety of contexts using the tools of mathematics, including technology.	A,D,E											P	
CSLO 7	Investigate individual attitudes towards mathematics and develop specific learning strategies, study techniques, and a fluency in mathematical communication.	E												
	MATH G - B-STEM Intermediate Algebra													
CSLO 1	Simplify expressions and solve equations of the following types: linear, quadratic (including some with complex solutions), rational, radical, absolute value, exponential, and logarithmic.	B, D												

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CSLO 2	Interpret and construct graphs of linear, quadratic, rational, exponential, and logarithmic functions and their inverse functions.	C												
CSLO 3	Translate, model, and solve applied problems using linear, quadratic, rational, radical, exponential, and logarithmic functions, systems of equations.	A,B,D												
CSLO 4	Develop the ability to think critically and solve problems in a variety of contexts using the tools of mathematics, including technology.	A,D,E												
CSLO 5	Construct clear, complete and accurate solutions to mathematical problems and logically communicate solutions in a variety of ways including written, graphically and verbally.	A,B,C,D												
CSLO 6	Investigate individual attitudes towards mathematics and develop specific learning strategies, study techniques, and a fluency in mathematical communication.	E												
	MATH S - Just in Time Support for B-STEM Intermediate Algebra													
CSLO 1	Perform mathematical operations in the context of Intermediate Algebra problems using manipulation and simplification of real numbers.	B												
CSLO 2	Solve linear equations, inequalities and systems of equations as they relate to more complex and applied Intermediate Algebra problems.	A,B												
CSLO 3	Interpret and construct graphs of linear and quadratic equations and build upon this foundation of graphing knowledge to graph rational, root, exponential and logarithmic graphs in Intermediate Algebra.	C,D												
CLSO 4	Investigate individual attitudes towards mathematics and develop specific learning strategies, study techniques, and a fluency in mathematical communication.	E												
CSLO 5	Identify and utilize campus mathematics and general academic services to improve chances for academic success as needed.	E												

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	MATH 10 - Problem Solving													
CSLO 1	Think divergently while designing and evaluating a variety of approaches when brainstorming possible solutions to new problems from a variety of mathematical situations and other disciplines.	A,D, E												
CSLO 2	Develop and implement strategies for approaching unfamiliar mathematical problems from a variety of areas.	A,C,D, E								P				
CSLO 3	Through writing, small group work, and oral presentation, logically present clear, complete, accurate, and sufficiently detailed solutions to communicate reasoning and demonstrate the solution of problems.	D, E												
CSLO 4	Evaluate, improve, and correct the appropriateness and reasonableness of a solution to a problem that was presented orally, in small groups, or in written form.	B,D, E		C										
CSLO 5	Develop mathematical and logical communication skills in small groups, oral presentations, and writing.	D,E												
	MATH 12 - College Algebra													
CSLO 1	Simplify expressions and solve equations of the following types: linear, quadratic (including some with complex solutions), rational, radical, absolute value, exponential, and logarithmic.	B,D												
CSLO 2	Interpret and construct graphs of quadratic, rational, exponential, logarithmic functions, and conic sections.	A,C									P			
CSLO 3	Translate, model, and solve applied problems utilizing polynomial, rational, radical, exponential, logarithmic functions, and matrix algebra.	A,C,D		C	C									
CSLO 4	Logically present clear, complete, accurate, and sufficiently detailed solutions to communicate reasoning and demonstrate the method of solving problems.	A,D,E												
CSLO 5	Apply techniques from linear algebra and combinatorics.	A,D												

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	MATH 13 - Elementary Statistics													
CSLO 1	Recognize, label and identify data by type and level of measurement.	D		C								P		
CSLO 2	Construct and interpret data using graphical and numerical methods of descriptive statistics.	A,C				C								
CSLO 3	Solve, calculate, and interpret problems involving basic elements of probability and sampling.	A,D				C								
CSLO 4	Conduct hypothesis tests and construct confidence interval estimates for population means and proportions; chi-square tests for goodness-of-fit and independence; linear regression and correlation; and one-way analysis of variance (ANOVA).	A,C,D,E		C		C								
CSLO 5	Logically present clear, complete, and sufficiently detailed solutions to demonstrate understanding and communicate reasoning of statistical methods using technology when appropriate.	A,D,E												
	MATH 15 - Discrete Mathematics													
CSLO 1	Logically present clear, complete, accurate, and sufficiently detailed solutions to communicate reasoning and demonstrate the method of solving problems.	D,E												
CSLO 2	Construct valid proofs of theorems using the following techniques: mathematical induction, direct and indirect proofs, by contradiction, with truth tables, and by logical equivalences.	D,E											P	
CSLO 3	Solve counting problems using combinatorics, recurrence relations, and generating functions.	A,B,D						C						
CSLO 4	Solve applied problems using discrete probability theory, graph theory, tree diagrams, and Boolean Algebra.	A,C,D												

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	MATH 16A - Calculus for Social and Life Sciences													
CSLO 1	Evaluate limits of functions using limit laws and graphical methods and utilize limits to determine continuity.	A,C												
CSLO 2	Calculate derivatives and integrals of algebraic, exponential, and logarithmic functions.	D							P					
CSLO 3	Translate, model, and solve applied problems in the social and life sciences utilizing derivatives and integrals.	A,D			C									
CSLO 4	Construct graphs of algebraic functions using their derivatives.	C												
CSLO 5	Logically present clear, complete, accurate, and sufficiently detailed solutions to communicate reasoning and demonstrate the method of solving problems.	A,D,E												
	MATH 16B - Calculus for Social and Life Sciences													
CSLO 1	Calculate integrals of algebraic, trigonometric, inverse, and transcendental functions.	D		C										P
CSLO 2	Sketch graphs of trigonometric functions using calculus techniques.	C												
CSLO 3	Translate, model, and solve optimization problems utilizing differentiation, partial differentiation, integration, and Lagrange multipliers.	A,D				C								
CSLO 4	Analyze points, surfaces, and graphs in three dimensions.	C												
CSLO 5	Logically present clear, complete, accurate, and sufficiently detailed solutions to communicate reasoning and demonstrate the method of solving problems.	A,D,E												
	MATH 17 - Concepts of Mathematics													
CSLO 1	Develop and implement strategies for approaching unfamiliar mathematical problems.	A,C,D,E		C										
CSLO 2	Evaluate, improve, and correct orally presented or written solutions.	D,E												
CSLO 3	Logically present clear, complete, accurate, and sufficiently detailed solutions to communicate reasoning and demonstrate the method of solving problems.	A,D,E								P				
	MATH 18 - The Nature of Mathematics													
CSLO 1	Solve college level math problems from a variety of different areas.	A,E												
CSLO 2	Utilize linear, quadratic, exponential, and logarithmic equations, systems of equations, and their graphs to analyze mathematical applications from various disciplines.	A,B,C,E									P			
CSLO 3	Analyze given information and implement strategies for solving problems involving mathematical and logical reasoning.	A,D,E												
CSLO 4	Use mathematical modeling as a problem solving tool in other disciplines and contexts.	A,C,E												
CSLO 5	Logically present clear, complete, accurate, and sufficiently detailed solutions to communicate reasoning and demonstrate the method of solving problems.	A,D,E		C										
	MATH 19 - Mathematical Concepts for Elementary School Teachers													

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CSLO 1	Analyze the structure and properties of rational and real number systems including their decimal representation and illustrate the use of a representation of these numbers including the number line model.	A,C,E												
CSLO 2	Analyze multiple approaches to solving problems from elementary to advanced levels of mathematics, using concepts and tools from sets, logic, functions, number theory and patterns.	A,E												
CSLO 3	Plan math activities for elementary aged children in line with course content and the Common Core standards.	C,D,E												
	MATH 24 - Modern Business Mathematics													
CSLO 1	Apply rates of change to marginal analysis and business applications.	A,D												
CSLO 2	Logically present clear, complete, accurate, and sufficiently detailed solutions to communicate reasoning and demonstrate the method of solving business problems.	A,D,E		C										
CSLO 3	Translate, model, and solve applied business problems utilizing derivatives.	A,B,D					C							
CSLO 4	Construct and interpret graphs of polynomial, exponential, logarithmic, and composite functions; solve linear programming problems graphically.	A,C,D										P		
	MATH 27 - Trigonometry													
CSLO 1	Solve trigonometric equations and triangles. Manipulate trigonometric expressions and identities, vectors, and polar representations of complex numbers.	B,C				C			P					
CSLO 2	Interpret and construct graphs of trigonometric functions, conic sections, parametric equations, and vectors utilizing rectangular and polar coordinates.	A,C				C								
CSLO 3	Translate, model, and solve applied problems utilizing trigonometric functions and vectors.	A		C		C								
CSLO 4	Logically present clear, complete, accurate, and sufficiently detailed solutions to communicate reasoning and demonstrate the method of solving problems.	A,D, E												
	MATH 29 - Pre-Calculus Mathematics													
CSLO 1	Simplify expressions and solve equations of the following types: linear, quadratic (including some with complex solutions), rational, radical, absolute value, exponential, logarithmic, and trigonometric.	B,D												
CSLO 2	Interpret and construct graphs of polynomial, rational, exponential, logarithmic, and trigonometric functions, and conic sections.	A,C											P	
CSLO 3	Translate, model, and solve applied problems utilizing polynomial, rational, radical, exponential, logarithmic, trigonometric functions, and matrix algebra.	A,C,D					C							
CSLO 4	Logically present clear, complete, accurate, and sufficiently detailed solutions to communicate reasoning and demonstrate the method of solving problems.	A,D,E												
CSLO 5	Apply techniques from linear algebra and combinatorics.	A,D												

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	MATH 30 - Analytical Geometry and Calculus I													
CSLO 1	Evaluate limits of functions using limit laws, the definition of a limit, or L'Hospital's Rule; and utilize limits to determine continuity.	A,D												P
CSLO 2	Calculate derivatives and integrals of algebraic and transcendental functions.	A,D		C										
CSLO 3	Translate, model, and solve applied problems utilizing derivatives and integrals.	A,D			C									
CSLO 4	Construct graphs of algebraic and transcendental functions using their derivatives.	C												
CSLO 5	Logically present clear, complete, accurate, and sufficiently detailed solutions to communicate reasoning and demonstrate the method of solving problems.	A,D												
	MATH 31 - Analytical Geometry and Calculus II													
CSLO 1	Integrate algebraic and transcendental functions.	A,D		C										
CSLO 2	Construct and interpret graphs of parametric and polar equations applying appropriate calculus techniques.	C							P					
CSLO 3	Translate, model, and solve applied problems utilizing differentiation, integration, and infinite series.	A,D			C									
CSLO 4	Demonstrate knowledge and theory of infinite series by applying appropriate theorems to determine convergence and divergence.	D												
CSLO 5	Logically present clear, complete, accurate, and sufficiently detailed solutions to communicate reasoning and demonstrate the method of solving problems.	A,D												
	MATH 32 - Analytical Geometry and Calculus III													
CSLO 1	Calculate partial derivatives and multiple integrals of multivariable functions.	A,D								P				
CSLO 2	Translate, model, and solve applied problems utilizing vector functions, partial derivatives, Lagrange multipliers, Second Derivative Test for multivariable functions, Green's Theorem, Stokes' Theorem, and the Divergence Theorem.	A,D		C										
CSLO 3	Utilize graphs of multivariable functions to set up, evaluate, and solve double and triple integrals; including rectangular, cylindrical, and spherical coordinates.	C,D												
CSLO 4	Logically present clear, complete, accurate, and sufficiently detailed solutions to communicate reasoning and demonstrate the method of solving problems.	A,D												

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	MATH 33 - Differential Equations and Linear Alegebra													
CSLO 1	Solve first and higher order ordinary and linear differential equations; using Laplace transformations, numerical, and series methods.	A,B,D									P			
CSLO 2	Utilize theorems from linear algebra and use matrices to solve systems of equations, including differential equations.	A,D				C								
CSLO 3	Utilize theorems from linear algebra to classify sets and mappings.	D			C									
CSLO 4	Ppresent clear, complete, accurate, and sufficiently detailed solutions to communicate reasoning and demonstrate the method of solving problems.	A,D		C										
	MATH 42 - Business Calculus													
CSLO 1	Evaluate limits of functions using limit laws and graphical methods.	A,C												
CSLO 2	Calculate derivatives, partial derivatives, and integrals.	A,D										P		
CSLO 3	Translate, model, and solve applied business problems utilizing derivatives and integrals.	A,D					C							
CSLO 4	Present clear, complete, accurate, and sufficiently detailed solutions to communicate reasoning and demonstrate the method of solving business problems.	A,D,E												
	MATH 581 - Arithmetic Review													
CSLO 1	Analyze and apply algorithms of the order of operations and exponential notation for whole numbers, fractions, decimals, ratios, proportions and percents.	A		C					P					
CSLO 2	Translate, model and solve applied problems using whole numbers, fractions, decimals, proportions and percents.	A,E												
CSLO 3	Develop fluency in mathematical communication by logically presenting clear, complete, and sufficiently supported reasoning for mathematical solutions.	A,D,E												
	MATH 581S - Summer Bridge Arithmetic Review													
CSLO 1	Review and compute fundamental arithmetic operations.													

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	MATH 582 - Pre-Algebra													
CSLO 1	Analyze and apply algorithms of the order of operations and exponential notation for integers, fractions, decimals, ratios, proportions, percents and variable expressions.	A,B								P				
CSLO 2	Simplify, evaluate and solve linear equations involving integers, decimals, fractions, ratios, proportions and percents.	A,B		C										
CSLO 3	Demonstrate understanding of the Cartesian Coordinate System and graph linear equations by using substitution to determine ordered pairs.	C					C							
CSLO 4	Translate, model and solve applied problems using integers, fractions, decimals and percents for both one and two variable linear equations.	A,B,E												
CSLO 5	Develop fluency in mathematical communication by logically presenting clear, complete, and sufficiently supported reasoning for mathematical solutions.	A,D,E												
	MATH 584 - Math Success-Overcoming Math Anxiety													
CSLO 1	Identify and develop successful learning strategies specific to a mathematics class.	C,D,E									P			
CSLO 2	Investigate individual attitudes towards mathematics and develop specific learning strategies and study techniques. (Math Confidence)	E												
CSLO 3	Formulate techniques to address math anxiety and assess effectiveness.	E												
CSLO 4	Develop fluency in mathematical communication. (Math Confidence)	D,E												
	MATH 585 - Foundations of Mathematics													
CSLO 1	Apply the concept of numeracy in multiple contexts, including historical perspectives. (Numeracy)	A,D,E												P
CSLO 2	Use algebra to recognise and write relationships involving variables; interpret those relationships and solve problems. (Algebraic Reasoning and Computation)	A,B,D												
CSLO 3	Recognize proportional relationships and use proportional reasoning to solve problems. (Proportional Reasoning)	A,B,C												
CSLO 4	Develop the ability to think critically and solve problems in a variety of contexts using the tools of mathematics. (Critical Thinking)	A,D												
CSLO 5	Develop fluency in mathematical communication. (Math Confidence)	C,D,E												
CSLO 6	Investigate individual attitudes towards mathematics and develop specific learning strategies and study techniques. (Math Confidence)	E												
	MATH 28 - Independent Study													
CSLO 1														
CSLO 2														
CSLO 3														
	COURSE # - Title													
CSLO 1														

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CSLO 2														
CSLO 3														
CSLO 4														
CSLO 5														
CSLO 6														