**Outcome Assessment Timeline**

**Academic Programs**

**MATHEMATICS AND COMPUTER SCIENCE – FALL 2018**

| **APR / SLO 3-Year Cycle** | **2017-2020** | | |
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| **Course ID** | **Course-Level Student Learning Outcome (CSLO)** | **Measure/Collect Data** | **Discuss and Plan** |
| MATH 100  Mathematics for General Education | Calculate and interpret the probability and odds of everyday events. | Spring 2018 | Fall 2018 |
| Using real-world data, analyze contemporary mathematical problems by applying problem solving techniques using a variety of methods. And then, communicate the results mathematically through a variety of forms. | Spring 2019 | Fall 2019 |
| MATH 101  College Algebra | Analyze properties and behavior of functions and implement appropriate techniques to solve applications. | Spring 2017 | Fall 2017 |
| Use a variety of methods to solve systems of equations and implement those methods to solve application problems. Recognize and graph conic sections. Analyze the behavior of sequences and series. Apply the binomial expansion theorem. | Spring 2018 | Fall 2018 |
| MATH 104  Trigonometry | Analyze properties and behavior of trigonometric functions and implement appropriate techniques to solve applications. | Spring 2017 | Fall 2017 |
| Use polar coordinates; represent complex numbers in rectangular and trigonometric forms; perform operations with complex numbers. | Spring 2018 | Fall 2018 |
| MATH 110  Mathematics for Elementary School Teacher I | Apply different strategies to solve problems - including but not limited to guess and check, sketch pictures and diagrams, look for patterns, work backwards, and solve similar problems. | Spring 2017 | Fall 2017 |
| Identify and apply the properties and basic operations from the whole number to the rational number system. | Spring 2018 | Fall 2018 |
| Analyze computational situations to obtain and justify solutions using techniques such as mental arithmetic, estimation, traditional and non-traditional algorithms. | Spring 2019 | Fall 2019 |

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| MATH 111  Mathematics for Elementary School Teachers II | Demonstrate familiarity with basic geometric vocabulary. | Spring 2017 | Fall 2017 |
| Identify fundamental geometric properties of two- and three-dimensional shapes, including congruency, similarity, and transformations. | Spring 2018 | Fall 2018 |
| Find values of such quantities as perimeter, area, surface area, volume, etc. for certain two and three dimensional shapes. | Spring 2019 | Fall 2019 |
| Identify and describe different problem solving strategies -- including but not limited to guess and check, pattern identification, working backwards, and solving similar problems - and use them to represent and solve problems in multiple ways | Spring 2018 | Fall 2018 |
| MATH 112  Children’s Mathematical Thinking | Read and critique article(s) pertaining to problem solving with whole numbers or fractions. | Spring 2017 | Fall 2017 |
| Analyze children's understanding of basic arithmetic operations with whole numbers, fractions, and decimals. | Spring 2018 | Fall 2018 |
| MATH 115  Statway II | Use appropriate vocabulary and tools to analyze and describe a statistical question. | Spring 2017 | Fall 2017 |
| Recognize statistical applications in everyday life and apply appropriate analytical tools and problem solving skills. | Spring 2019 | Fall 2019 |
| Recognize and apply algebraic vocabulary, symbols, and properties, and evaluate and perform operations on algebraic expressions. | Spring 2018 | Fall 2018 |
| MATH 119  Elementary Statistics | Identify, explain and summarize statistical concepts and terminology. | Spring 2017 | Fall 2017 |
| Identify, analyze, and construct formal tests of hypotheses concerning single population means and single population proportions. | Spring 2018 | Fall 2018 |

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| MATH 120  Calculus for Business Analysis | Solve equations and inequalities using algebraic, numerical, and graphical processes, in both mathematical and applied settings, and correctly interpret the results as measured by completion and accuracy of individual tasks graded by teacher-generated rubric. | Spring 2017 | Fall 2017 |
| Demonstrate knowledge, comprehension, and application of concepts from business calculus including, but not limited to finding maximum and minimum values of a function, and describing the behavior of a function such as the intervals where a function is increasing, decreasing, concave upward and concave downward. | Spring 2018 | Fall 2018 |
| MATH 121  Applied Calculus I | Apply knowledge of the definitions, properties, and concepts of differential calculus to evaluating derivatives of polynomial, rational, radical, exponential, and logarithmic functions. | Spring 2017 | Fall 2017 |
| Apply appropriate critical thinking, analytical reasoning, and concepts of first semester calculus to the solutions of problems in the fields of physical science, social science and biology | Spring 2018 | Fall 2018 |
| Demonstrate knowledge and the application of concepts of algebra, analytic geometry, and properties and concepts of differential calculus to finding tangent lines, rates of change, velocity, curve sketching, and optimization | Spring 2019 | Fall 2019 |
| MATH 122  Applied Calculus II | Demonstrate knowledge and appropriate application of the definitions, rules, and concepts | Spring 2017 | Fall 2017 |
| Apply integration techniques to solve problems including areas, volumes, and average value | Spring 2018 | Fall 2018 |
| MATH 130  Introduction to Computer Programming | Write, compile, run, and test simple Java programs using a text editor or an integrated development environment (IDE), such as Eclipse. | Spring 2018 | Fall 2018 |
| Apply the key principles of object-oriented programming, including abstraction, inheritance, polymorphism, and encapsulation. | Spring 2019 | Fall 2019 |
| Use conditional logic, loops, and arrays in a Java application. | Spring 2017 | Fall 2017 |

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| MATH 140  Data Structures and Algorithms | Describe problem requirements and employs correct programming constructs and syntax to create a working solution. | Spring 2018 | Fall 2018 |
| Identify necessary data structures or existing algorithms and use them to solve a problem. | Spring 2017 | Fall 2017 |
| MATH 230  Computer Organization and Architecture | Demonstrate how fundamental high-level programming constructs are implemented at the machine-language level. | Spring 2018 | Fall 2018 |
| Use an understanding of computer organization and architecture to structure programs to perform more efficiently. | Spring 2017 | Fall 2017 |
| MATH 241M | Model real world situations with and interpret solutions. | Spring 2018 | Fall 2018 |
| Utilize mathematical resources and technology while demonstrating numerical reasoning and literacy. | Spring 2019 | Fall 2019 |
| MATH 241P | Use conditional logic, loops, and arrays to analyze data. | Spring 2018 | Fall 2018 |
| Write, compile, run, and test Python applications using an integrated development environment (IDE) such as Eclipse. | Spring 2019 | Fall 2019 |
| Use object-oriented programming to model real-world applications. | Spring 2020 | Fall 2020 |
| MATH 244  Pre-Calculus with Trigonometry | Analyze properties and behavior of functions and implement appropriate techniques to solve applications. | Spring 2017 | Fall 2017 |
| Use a variety of methods to solve systems of equations and implement those methods to solve application problems. Recognize and graph conic sections. Analyze the behavior of sequences and series. Apply the binomial expansion theorem. | Spring 2018 | Fall 2018 |
| Analyze properties and behavior of trigonometric functions and implement appropriate techniques to solve applications. | Spring 2017 | Fall 2017 |
| Use polar coordinates; represent complex numbers in rectangular and trigonometric forms; perform operations with complex numbers. | Spring 2018 | Fall 2018 |

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| MATH 250  Analytic Geometry and Calculus II | Use the basic definitions, properties, theorems, and techniques of first semester Calculus to solve problems and applications. | Spring 2018 | Fall 2018 |
| Analyze and sketch graphs using the principles of calculus. | Spring 2019 | Fall 2019 |
| Evaluate limits, derivatives and integrals numerically, graphically and algebraically. | Spring 2017 | Fall 2017 |
| MATH 251  Analytic Geometry and Calculus II | Use the basic definitions, properties, theorems, and techniques of second semester Calculus to solve problems and applications. | Spring 2017 | Fall 2017 |
| Apply Calculus techniques to curves given in polar and parametric form, including graphing, equations of tangent lines, arclength, and area. | Spring 2018 | Fall 2018 |
| Find and apply power series representations of functions and determine possible errors, radius of convergence, and corresponding derivatives and integrals. | Spring 2019 | Fall 2019 |
| MATH 252  Analytic Geometry and Calculus III | State and apply basic definitions, properties, and theorems of multivariable Calculus to solve problems and applications. | Spring 2017 | Fall 2017 |
| Apply vector operations in two and three dimensions and use vector methods to analyze plane and space curves, and curvilinear motion. | Spring 2018 | Fall 2018 |
| MATH 253  Intro to Differential Equations | Use the basic definitions, properties, theorems, and techniques of Differential Equations to solve problems and applications. | Spring 2018 | Fall 2018 |
| Apply various methods to solve the vast array of differential equations encountered in Differential Equations. | Spring 2017 | Fall 2017 |
| MATH 254  Intro to Linear Algebra | Write clear and accurate proofs for some of the results used in the course. | Spring 2017 | Fall 2017 |
| Use matrices and their operations to solve linear systems and use linear transformations to model real-life problems. | Spring 2018 | Fall 2018 |
| MATH 11 | Retake the Math Assessment test and place at least two levels above prior placement. | Spring 2018 | Fall 2018 |
| Score at least 70% on a Math 60 Departmental Final Exam. | Spring 2019 | Fall 2019 |

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| MATH 260  Discrete Math | Communicate mathematical ideas and concepts to various audiences. | Spring 2018 | Fall 2018 |
| Construct mathematical proofs using standard techniques such as induction, contradiction, and contraposition. | Spring 2017 | Fall 2017 |
| Assess the validity of mathematical arguments. | Spring 2020 | Fall 2020 |
| MATH 35  Pre-algebra | Perform calculations with, convert between, solve applications, or compare whole numbers, fractions, decimals and percents without a calculator | Spring 2017 | Fall 2017 |
| Set-up and simplify ratios and rates; solve problems involving proportions, conversions or geometric problems involving perimeter, circumference, area and volume; all without a calculator | Spring 2018 | Fall 2018 |
| Solve linear equations that contain integers, fractions or decimals; apply exponent rules to simplify exponential expressions; evaluate and perform algebraic operations on polynomials, and solve application problems; all without a calculator | Spring 2019 | Fall 2019 |
| MATH 45  Elementary Algebra | Recognize and apply algebraic vocabulary, symbols, and properties, and evaluate and perform operations on algebraic expressions | Spring 2017 | Fall 2017 |
| Solve linear equations, quadratic equations and linear inequalities, including applications | Spring 2018 | Fall 2018 |
| Graph lines and inequalities in two variables and apply to linear models | Spring 2019 | Fall 2019 |
| MATH 48  Developmental Mathematics | Recognize and apply algebraic vocabulary, symbols, and properties, and evaluate and perform operations on algebraic expressions | Spring 2017 | Fall 2017 |
| Solve linear equations, quadratic equations and linear inequalities, including applications | Spring 2018 | Fall 2018 |
| Graph lines in two variables and apply to linear models | Spring 2019 | Fall 2019 |

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| MATH 57  Statway I | Use appropriate vocabulary and tools to analyze and describe a statistical question. | Spring 2018 | Fall 2018 |
| Recognize statistical applications in everyday life and apply appropriate analytical tools and problem solving skills. | Spring 2019 | Fall 2019 |
| Recognize and apply algebraic vocabulary, symbols, and properties, and evaluate and perform operations on algebraic expressions | Spring 2017 | Fall 2017 |
| MATH 60  Intermediate Algebra I | Recognize and apply algebraic vocabulary and definitions, symbols, and properties; evaluate and perform operations on algebraic expressions, and solve equations and inequalities | Spring 2017 | Fall 2017 |
| Graph linear, quadratic and radical functions, and circles | Spring 2018 | Fall 2018 |
| Use algebraic techniques to model and solve applications | Spring 2019 | Fall 2019 |
| MATH 70  Intermediate Algebra II  ***\*Course No Longer Offered\**** | Demonstrate knowledge and appropriate application of absolute value, polynomial, radical, rational, exponential, inverse, and logarithmic functions. (done twice in error…) | Spring 2017  Spring 2018 | Fall 2018 |
| Analyze and graph functions and conics using algebraic methods and graphing calculator. |  |  |
| Recognize mathematical applications in everyday life and apply appropriate critical thinking and algebraic problem solving skills. |  |  |

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| **Program** | **Program-Level Student Learning Outcome (PSLO)** | **Measure/Collect Data** | **Discuss and Plan** |
| Mathematics 01580 Associate in Art | Use the basic definitions, properties, theorems, and techniques of Calculus. | Spring 2018 | Fall 2018 |
| Associate of Science in Mathematics Studies in Transfer 01585 Associate in Science | Use the basic definitions, properties, theorems, and techniques of Calculus. | Spring 2018 | Fall 2018 |
| Computer Science 02191 Certificate | Recognize and appropriately apply current and historical Software Engineering design patterns, algorithms, and data structures to produce efficient, well-engineered software products. | Spring 2018 | Fall 2018 |
| Computer Science 02190  Associate in Science | Recognize and appropriately apply current and historical Software Engineering design patterns, algorithms, and data structures to produce efficient, well-engineered software products. | Spring 2018 | Fall 2018 |
| Computer Science 01180  Associate in Arts | Recognize and appropriately apply current and historical Software Engineering design patterns, algorithms, and data structures to produce efficient, well-engineered software products. | Spring 2018 | Fall 2018 |
| Associate Degree in Computer Science for Transfer 01185  Associate in Science Transfer | Recognize and appropriately apply Software Engineering design patterns, algorithms, and data structures to produce efficient, well-engineered software products. | Spring 2018 | Fall 2018 |