

Course Level Student Outcomes

Math 016 - Student will be able to

- 1) add, subtract, multiply, divide and exponentiate integers and rational numbers written as decimals or fractions.
- 2) perform combinations of operations on integers and rational numbers.
- 3) distinguish equivalent forms of numbers and numerical expressions from different ones.
- 4) write integers and rational numbers in canonical forms.
- 5) solve percent problems

Math 017 - Student will be able to

- 1) recognize equivalent algebraic expressions.
- 2) perform basic operations on algebraic expressions.
- 3) solve linear equations and inequalities in one variable and graph linear inequalities in one variable.
- 4) write algebraic expressions in canonical forms.
- 5) factor greatest common factor, difference of squares.

Math 118 - Student will be able to

- 1) add, subtract, multiply, divide and factor polynomials.
- 2) add, subtract, multiply, divide and reduce rational expressions.
- 3) solve linear equations and inequalities in one variable.
- 4) solve absolute value equations in one variable.
- 5) graph linear equations and determine equations of lines.
- 6) solve 2 x 2 linear systems.
- 7) solve quadratic equations in one variable.

Math 121 - Student will be able to

- 1) convert numbers from one number base to another.
- 2) perform basic arithmetic operations on numbers in decimal, binary and hexadecimal form.
- 3) construct truth tables for logical propositions and determine if two propositions are equivalent.
- 4) determine if a logical argument is valid.
- 5) evaluate set theoretical expressions and determine if two sets are equal.
- 6) determine properties of binary relations and partial orders and create matrix, diagrammatic and graphical representations of relations.
- 7) operate with Boolean expressions and minimize Boolean functions.

Math 135 - Student will be able to

- 1) determine the meaning and truth value of a logical sentence, given a propositional interpretation.
- 2) translate a verbal sentence into logical symbols.
- 3) construct truth tables for logical propositions and determine if two propositions are equivalent.
- 4) operate with logical quantifiers.
- 5) determine if a set of propositions is logically consistent.
- 6) determine if a logical argument is valid and determine if a statement is entailed by another.
- 7) deduce a given logical conclusion from a set of premises using rules of inference.
- 8) operate with Boolean expressions.

Math 137 - Student will be able to

- 1) identify, describe, classify and compare geometric figures and objects.
- 2) visualize and represent 2-d figures and 3-d geometric objects and develop spatial sense using computer-based technology and traditional tools of geometry.
- 3) apply geometric properties and relationships and use geometric models to represent and solve problems and real-world applications.
- 4) transform and tessellate geometric figures.
- 5) understand and appreciate the historical development and application of geometry in fields such as art, architecture, design and construction.

Math 150 - Student will be able to

- 1) graph a set of one-variable data and identify symmetry, skewness, number of clusters, and outliers.
- 2) make a scatter plot of two-variable data and use it to describe the linear correlation between the two variables.
- 3) compute and interpret one-variable and two-variable descriptive statistics including mean, median, mode, range, interquartile range, standard deviation, variance, correlation, slope, and intercept.
- 4) use small data sets provided to set up and test hypotheses about a population proportion using binomial probabilities.
- 5) algebraically manipulate statistical formulas to derive other statistical formulas.

Math 151 - Student will be able to

- 1) graph lines, linear inequalities and systems of linear inequalities in the plane.
- 2) determine whether a system of linear equations is independent, dependent or inconsistent, and solve systems of linear equations using matrices.
- 3) solve linear programming problems graphically and using the simplex method.

Math 152 - Student will be able to

- 1) perform basic set operations.
- 2) apply basic counting techniques to solve counting problems.
- 3) create probability models for simple experiments and solve probability problems.
- 4) solve problems involving probability distributions.

Math 153 - Student will be able to

- 1) solve problems in the mathematics of buying including unit prices, markup and discount.
- 2) solve problems involving inflation and depreciation.
- 3) solve problems in the mathematics of taxes including sales tax, property tax and income tax.
- 4) solve problems in the mathematics of saving including simple interest, compound interest and fixed annuities.
- 5) solve problems in the mathematics of borrowing such as promissory notes, installment loans, annual percentage rate, home mortgages, financing a car, credit cards, etc.

Math 161 - Student will be able to

- 1) determine basic properties of functions.
- 2) perform operations on functions.
- 3) graph polynomial and rational functions.
- 4) perform operations on complex numbers.
- 5) find real and complex roots of quadratic functions.
- 6) graph transformations of functions.
- 7) graph and determine properties of conic sections.

Math 162 - Student will be able to

- 1) graph and determine properties of exponential and logarithmic functions.
- 2) graph and determine properties of trigonometric functions.
- 3) graph and determine properties of inverse trigonometric functions.
- 4) solve problems using trigonometric identities.
- 5) use polar coordinates to graph polar equations.
- 6) convert complex numbers between rectangular and polar form.
- 7) perform operations on vectors in the plane.

Math 163 - Student will be able to

- 1) solve problems involving basic concepts of logic, set theory and functions.
- 2) apply basic counting techniques to solve counting problems.
- 3) solve problems involving mathematical induction and recurrence relations.
- 4) determine properties of relations and use digraphs to represent relations.
- 5) determine properties of graphs and trees.
- 6) use Boolean algebra to minimize logic circuits.

Math 171 - Student will be able to

- 1) evaluate limits of functions.
- 2) differentiate algebraic and transcendental functions.
- 3) solve problems involving rates of change and optimization problems.
- 4) graph functions and determine features of graphs such as intervals of increase and decrease, concavity, inflection points, asymptotes, holes, etc.
- 5) find anti-derivatives of functions and evaluate definite integrals using the definition of the integral and the Fundamental Theorem of Calculus.
- 6) evaluate definite and indefinite integrals using substitution.

Math 172 - Student will be able to

- 1) evaluate integrals using a variety of techniques.
- 2) solve problems involving applications of integrals such as finding areas, volumes, arc length, work, etc.
- 3) differentiate and integrate functions defined by parametric equations or in polar form.
- 4) test infinite series for convergence and represent functions using power series.

Math 251 - Student will be able to

- 1) graph a set of one-variable data and identify symmetry, skewness, number of clusters, and outliers.
- 2) make a scatter plot of two-variable data and use it to describe the linear correlation between the two variables.
- 3) compute and interpret one-variable and two-variable descriptive statistics including mean, median, mode, range, interquartile range, standard deviation, variance, correlation, slope, and intercept.
- 4) use probability rules, counting rules, and formulas to compute probabilities.
- 5) compute confidence intervals and test hypotheses about proportions, means, and variances.
- 6) algebraically manipulate statistical formulas to derive other statistical formulas.

Math 263 - Student will be able to

- 1) construct mathematical proofs.
- 2) implement algorithms and evaluate their efficiency.
- 3) work with abstract structures arising from enumeration problems in order to sort lists, traverse graphs, search for substructures with specified properties, and to code methods of solutions within suitable formal schemes.
- 4) analyze graphs and trees combinatorially and to apply techniques of enumerating substructures of graphs and trees.

Math 270 - Student will be able to

- 1) solve systems of linear equations by a variety of techniques.
- 2) represent flats in a linear space using parameters or without using parameters.
- 3) find bases for linear spaces.
- 4) find matrix representations of linear transformations with respect to given bases.
- 5) compute invariants for linear maps, such as trace and determinant.

Math 271 - Student will be able to

- 1) find derivatives of maps from \mathbb{R}^n to \mathbb{R}^m .
- 2) compute line-integrals.
- 3) compute surface-integrals.
- 4) compute volume-integrals.
- 5) use Stokes' theorem to evaluate multi-dimensional integrals.

Math 272 - Student will be able to

- 1) solve special first-order equations explicitly.
- 2) solve special second-order equations explicitly.
- 3) solve differential equations, using Laplace-transforms.
- 4) solve differential equations in the form of power-series.
- 5) solve differential equations in the form of Fourier-series.