

**COMMON COURSE-LEVEL OUTCOMES**  
**MATH 091 - MATH 181, STAT 152**

Upon completion of Math 091 the student will be able to:

1. Perform addition, subtraction, multiplication, and division with whole numbers, fractions, mixed numbers, signed numbers, decimals, and percents.
2. Evaluate and simplify algebraic expressions and formulas.
3. Solve proportions for an unknown, including proportions involving decimals and fractions.
4. Use the Laws of Exponents to simplify monomials
5. Convert between units in the English and metric systems of measurement and between units within each system.
6. Find the perimeter, area, and volume of a variety of basic geometric figures.

Upon completion of Math 095 the student will be able to:

1. Identify, set up and solve a variety of applied problems using algebraic techniques.
2. Add, subtract, multiply, divide, and factor polynomials.
3. Graph and solve linear equations and inequalities.
4. Graph and solve quadratic equations and inequalities by various methods including the quadratic formula.

Upon completion of Math 096 the student will be able to:

1. Solve a variety of equations and inequalities including those involving absolute value, linear, quadratic, rational, and radical expressions.
2. Graph equations and inequalities as well as systems of equations and inequalities.
3. Find the equation of a line when given prescribed conditions.
4. Identify functions and the domain and range of functions.
5. Solve problems involving direct, inverse, or joint variation.
6. Perform operations on radical and rational expressions and simplify such expressions.
7. Solve a variety of real-word problems.

**MATH 097 – Beginning and Intermediate Algebra**

Includes all of the outcomes of MATH 095 and MATH 096.

**Math 120**

Upon completion of Math 120 the student will be able to:

1. Apply mathematical concepts in a proper and organized manner and perform basic dimensional analysis problems converting one unit of measurement to another.
2. Calculate and understand financial situations involving money which include interest, annuities, and loan amortization.
3. Identify spatial relationships and solve problems involving area, volume, and basic right triangle trigonometry.
4. Explain and apply basic set theory operations which includes Venn diagrams, cardinal numbers, tree diagrams, the Fundamental Principle of Counting, factorial notation, permutations and combinations.
5. Perform calculations involving the basic rules of probability which includes odds, combinatorics, and expected value.
6. Identify basic statistical and data analysis information which includes mean, median and mode, measures of dispersion, variance and standard deviation, and perform calculations involving the normal distribution and applications of the normal distribution.
7. Evaluate exponential and logarithmic functions and solve exponential growth & decay problems.
8. Interpret basic symbolic logic terminologies, such as deductive, inductive reasoning, conjunction, disjunction, necessary and sufficient conditions. Construct and apply truth tables of compound statements. Translate symbols into words and vice versa. Identify the converse, inverse and contrapositive of a conditional statement.

### **Math 126, 127, and 128**

Upon completion of Math 126 the student will be able to:

1. Solve a variety of equations and inequalities including linear, quadratic, polynomial, rational, absolute value, logarithmic, and exponential
2. Graph a variety of functions including linear, quadratic, polynomial, absolute value, rational, greatest integer, exponential, logarithmic and piecewise-defined functions by finding domain, range, zeros, intercepts, asymptotes, and describing symmetries.
3. Perform operations on functions, find the domain and range of a function as well as the inverse and difference quotient.
4. Use synthetic division, the Division algorithm, Remainder Theorem, and Factor Theorem to factor polynomials
5. Solve a variety of real-world problems involving quadratics, linear systems of equations, exponential and logarithmic function
6. Solve systems of equations with two or three variables using substitution, addition, Cramer's Rule, Gaussian elimination, or the inverse of a matrix. (Gaussian elimination and matrix inversion optional)
7. Perform operations on complex numbers and matrices (Matrix inversion is optional.)

Upon completion of Math 127 the student will be able to:

1. Compute values of the six trigonometric functions and their inverses

2. Graph and analyze parametric equations, trigonometric functions, conic sections, vectors, and polar equations and convert between the Cartesian and polar coordinate systems.
3. Perform operations with vectors and use vectors to solve real-world problems.
4. Solve trigonometric equations and right or oblique triangles
5. Express complex numbers in trigonometric form and perform operations with them.
6. Describe and define arithmetic and geometric sequences and make effective use of sigma notation
7. Describe and define arithmetic and geometric sequences and make effective use of sigma notation
8. Use the Principle of Mathematical Induction and apply the Binomial Theorem .

### **MATH 128 – Precalculus and Trigonometry**

Includes all of the outcomes of MATH 126 and MATH 127.

## **Math 181**

Upon completion of Math 181 the student will be able to:

1. Express algebraically, graphically, and numerically the concept of a continuous function.
2. Demonstrate an understanding of the concepts and terminology of limits through applications and examples.
3. Compute the derivative of a continuous function using the definition, rules of differentiation, slopes of tangent lines, and describe it as a rate of change in a number of natural and physical phenomena.
4. Apply basic applications of beginning calculus including but not limited to optimization, related rates, work, areas, and distances.
5. Compute basic integrals using Riemann sums as well as the Fundamental Theorem of Calculus.
6. Express algebraically, graphically, and numerically the separate concepts of definite and indefinite integration and their connection to differentiation.

## **STAT 152**

Upon completion of Stat 152 the student will be able to:

1. Select and produce appropriate graphical, tabular, and numerical summaries of the distributions of variables in a data set. Summarize such information into verbal and numeric descriptions.
2. Summarize relationships in bivariate data using graphical, tabular, and numerical methods including scatter plots, box plots, two-way tables, correlation coefficients, and linear regression.

3. Use the normal distribution to interpret z-scores and compute probabilities.
4. Construct a model for a random phenomenon using outcomes, events, and the assignment of probabilities.
5. Apply the concept of a sampling distribution and discuss the distribution of the sample proportion under repeated sampling (Central Limit Theorem).
6. Understand the dependence of margin of error on sample size and confidence level.
7. Apply methods of hypothesis testing to carry out a hypothesis about population means and population proportions and interpret the conclusion.