

MATHEMATICS

These course descriptions communicate the general content of the senior high mathematics courses. The courses are presented in three major strands to provide an idea of general types of mathematics programs throughout the four years of senior high school.

HONORS: This is the advanced placement strand. Each course in this sequence should be considered for highly capable mathematics students. Each course in this strand has a weighted grading scale. The major courses in this strand are Honors Geometry, Honors Algebra 2 with Trigonometry, Honors Pre-Calculus, AB Honors Calculus, BC Honors Calculus and AP Statistics. Students successfully completing Algebra 1 in the eighth grade (with teacher recommendation) have met the prerequisite for beginning the program.

COLLEGE PREPARATORY MATHEMATICS: This strand of courses will prepare students for future work in mathematics and the sciences. The major courses in this sequence are Algebra, Geometry A, Algebra 2 with Trigonometry, Finite Math, and Pre-Calculus. This strand is a follow-up of either eighth grade Algebra 1 or Math Modeling.

GENERAL COURSES FOR COLLEGE BOUND: Courses listed in this strand are Algebra 1, Geometry B, Algebra 2, and College Prep Math. Math Modeling in eighth grade or Algebra at the high school are prerequisites for courses in this strand. This strand is not suggested as preparation for universities with rigorous admission requirements or for students who wish to pursue a technical or math-related career.

The prerequisites listed on the next two pages represent requirements the student must meet for enrollment in a given course. Students who fail to meet the prerequisite must obtain the written consent of the math department to enroll.

GEOMETRY A

117201/117202

Grades: 9-12

GEOMETRY A

1 Math credit

Prerequisite: Algebra 1

This course requires students to focus on logical proof and critical thinking when solving problems or evaluating arguments. There is an emphasis on deductive reasoning and critical thinking. Geometric properties and concepts in both the plane and 3-dimensional space are covered. Topics include logic and probability, angles and lines, transformations, similarity, triangles, trigonometry, circles, and other polygons.

In this course, students will study families of functions including linear, quadratic, exponential, logarithmic, radical, rational, and trigonometric. These functions will be represented through equations, tables, and graphical representations. Modeling of real world scenarios and application of concepts to problems arising from those situations will be highlighted. This course is recommended for students planning to pursue a career in a STEM or Business field.

STATISTICS

117900

Grade: 11-12

STATISTICS

1/2 Math Credit

Prerequisite: Algebra 2

In this introductory course, students will collect data and use statistics as tools to recognize and examine the basic principles of describing and presenting data to reach reasonable conclusions. Students will explain the role of probability in statistics, analyze and compare various sampling distributions for both discrete and continuous random variables, and compute confidence intervals. The presentation, use, and interpretation of data, probability, sampling, correlation, and use of statistical software will be applied to current events and student directed investigations.

GEOMETRY B

116201/116202

Grades: 10-12

GEOMETRY B

1 Math credit

Prerequisite: Completion of Algebra program

The emphasis of this course is on geometric relationships of figures, visualization of geometric properties and measurement. Algebraic skills are integrated through application of geometric concepts. An introduction to proofs, mathematical language, logical reasoning, and critical thinking is included. Topics include logic and probability, angles and lines, transformations, similarity, triangles, trigonometry, circles, and other polygons.

TRIGONOMETRY

117410

Grade: 11-12

Trigonometry

1/2 Math Credit

Prerequisite: Algebra 2

ALGEBRA 2 WITH TRIGONOMETRY

117401/

Grades: 10-12

117402

ALG 2/TRIG

1 Math Credit

Prerequisite: Geometry A or consent of department

MATHEMATICS

In this course, classical right triangle trigonometry will be studied along with trigonometric identities and equations, the laws of sines and cosines, graphs and properties of the trigonometric functions and their inverses. Trigonometry will be defined using the unit circle approach and a graphical approach will be utilized throughout with an emphasis on solving application problems. This course is recommended for students who have successfully completed Algebra 2 and want additional preparation for standardized tests and college level mathematics.

PROBLEM BASED APPLICATIONS IN MATH

Grade: 11-12 **117801 & 117802**

Problem Based Apps in Math

1/2 Math Credit

Prerequisite: Completion of Algebra 2 or Consent of Department

This course focuses on mathematical reasoning and the solving of real-life problems. Emphasis will be on projects, cooperative learning, and application of math skills across career clusters, current events, and social justice issues. Statistics and probability, linear systems, logic, and financial math are some of the topics that will be addressed. This course can be taken for up to two semesters.

ALGEBRA 2 **117301/117302**

Grades: 11-12

ALGEBRA 2

1 Math Credit

Prerequisite: Geometry

This course continues the exploration of functions which began in Algebra I. Students will analyze functions graphically, numerically, algebraically and investigate how these functions can be used to represent real world data. Functions that will be studied include linear, quadratic, absolute value, polynomial, rational, radical, exponential, and logarithmic. This course is not recommended for students planning to pursue a career in a STEM or Business field.

COLLEGE ALGEBRA **117601&117602**

Grade: 11-12

College Algebra

1 Math Credit

Prerequisite: Algebra 2 with Trigonometry or departmental approval

This is a standard course in College Algebra that students may take in order to earn college credit through the University of Missouri, St. Louis. Topics include linear, quadratic, and rational equations and inequalities, the algebra and graphs of functions including polynomial, rational, exponential, and logarithmic, systems of equations, and sequences and series. This course is designed to fulfill one of the college mathematics

requirements for students planning to earn either a Bachelor of Science or Bachelor of Arts degree.

PRE-CALCULUS **117701/117702**

Grades: 11-12

PRE CALCULUS

1 Math credit

Prerequisite: Algebra 2 with Trigonometry

This course is designed to prepare students for college level mathematics. Students will describe, analyze, and graph basic algebraic and transcendental functions. Students will also study sequences, series, probability, conic sections, and will be introduced to the concept of limits. This class may be offered for college credit through University of Missouri - St. Louis.

HONORS PRE-CALCULUS **118701/118702**

Grades: 11-12

+PRE CALC

1 Math credit

Prerequisite: Honors Algebra 2 with Trigonometry or consent of department

This course is designed to prepare students for a calculus course during high school. The content consists of traditional Pre-Calculus topics, but the emphasis of the course is on the underlying structure of mathematics. Students will study, analyze, and apply basic algebraic and transcendental functions. A weighted grade is given.

AP STATISTICS **119901/119902**

Grades: 11-12

+AP STATS

1 Math Credit

Prerequisite: Algebra 2 with Trigonometry

This Advanced Placement course is for students who wish to complete the equivalent to an introductory, non-calculus based, college course in statistics. Students gain experience in four broad themes: exploring data, planning a study, anticipating patterns, and statistical inference. This course prepares students to take the College Board Advanced Placement Statistics examination and follows the College Board's recommended syllabus. This class may be offered for college credit through University of Missouri - St. Louis. This course is also available as a completely virtual/online course. Students who are interested should contact their counselor regarding the process for enrolling in the online course. A weighted grade is given.

AP CALCULUS AB **119801/119802**

Grade: 12

+AP CALC AB

1 Math Credit

Prerequisite: Pre-Calculus or consent of department

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This is an honors course that emphasizes a multi-representational approach to calculus through the exploration of limits, differentiation, integration and many applications within these areas. In this course students will study in depth situations involving change and accumulation using descriptive, analytical, numerical and graphical approaches. This course prepares students to take the College Board Advanced Placement Calculus AB examination which fulfills the requirements for Calculus I and follows the syllabus approved by the AP Audit. This class may be offered for college credit through University of Missouri - St. Louis.—A weighted grade is given.

AP CALCULUS BC

119851/119852

Grade: 12

+AP CALC BC

1 Math Credit

Prerequisite: Honors Pre-Calculus

This is an honors course that emphasizes a multi-representational approach to calculus through the exploration of limits, differentiation, integration, series, parametric functions, polar functions and many applications within these areas. In this course students will study in depth situations involving change and accumulation using descriptive, analytical, numerical and graphical approaches. This course prepares students to take the College Board Advanced Placement Calculus BC examination which fulfills the requirements for Calculus I and Calculus II and follows the syllabus approved by the AP Audit. This class may be offered for college credit through University of Missouri - St. Louis. A weighted grade is given.

HONORS CALCULUS III

118761/118762

Grade: 12

+Calculus III

1 Math Credit

Prerequisite: Calculus BC or consent of department

Calculus III continues the study of analytic geometry and calculus started in Calculus BC. The focus of this course is multi-dimensional analysis of figures with an emphasis on vectors properties, vector fields, vector analysis, vector valued functions, calculations, and applications of vectors. Additional topics will include cylindrical and spherical coordinates, arc length and curvature, functions of several variables, partial and directional derivatives, gradients, extrema, Lagrange multipliers, multiple integrals, change of variables, surface area, and Stokes' Theorem. A weighted grade is given.