



2022-23

Mathematics Department



Strong Values
STRONG WOMEN

MATHEMATICS

FRESHMEN

Required Courses

Algebra I (*1 credit*) or
Algebra I Accelerated (*1 credit*) or
Honors Geometry (*1 credit*) or
Honors Algebra II (*1 credit*)

SOPHOMORES

Required Courses

Geometry (*1 credit*) or
Honors Geometry (*1 credit*) or
Advanced Algebra II (*1 credit*) or
Honors Algebra II (*1 credit*)

Elective Courses

Calculus (*1 credit*)
AP/ACC Calculus AB (*1 credit*)
AP/ACC Calculus BC (*1 credit*)

JUNIORS

Required Courses

Algebra II (*1 credit*) or
Advanced Algebra II (*1 credit*) or
Honors Algebra II (*1 credit*)

Elective Courses

College Algebra (*1 credit*)
Probability and Statistics (*.5 credit*)
Trigonometry (*.5 credit*)
Calculus (*1 credit*)
ACC Precalculus (*1 credit*)
AP/ACP Statistics (*1 credit*)
AP/ACC Calculus AB (*1 credit*)
AP/ACC Calculus BC (*1 credit*)

SENIORS

Required Courses

Elective Courses

College Algebra (*1 credit*)
Probability and Statistics (*.5 credit*)
ACC Precalculus (*1 credit*)
Trigonometry (*.5 credit*)
Calculus (*1 credit*)
AP/ACP Statistics (*1 credit*)
AP/ACC Calculus AB (*1 credit*)
AP/ACC Calculus BC (*1 credit*)

MATHEMATICS

GOAL STATEMENT

The goals of the Mathematics Department are to offer a complete high school mathematics curriculum for the college-bound student and to challenge each individual to develop her God-given mathematical talents.

OBJECTIVES

1. Students will develop logical and creative approaches to problem solving.
2. Students will develop facility in applying basic mathematical concepts.
3. Students will develop clarity and precision in language usage.
4. Students will develop an appreciation for the deductive nature of mathematics.
5. Students will select courses that allow her maximum achievement for her abilities, needs, and interests.
6. Students will experience a smooth transition to mathematics courses at the college level.

REQUIREMENTS

Four credits in mathematics are required for graduation. A Texas Instruments graphing calculator is required for all mathematics classes. The model numbers of the calculators that may be used are announced in the spring.

HONORS COURSE ELIGIBILITY POLICY

Eligibility for honors level math courses is determined based on the student's semester grades in prerequisite courses and teacher recommendations. Eligibility for honors level math courses, for incoming freshmen, is determined on a placement test. This test is given during the spring of the student's 8th grade year on the SJA campus. To be eligible for ACC or ACP courses, students must meet the criteria of the Dual Credit programs through SLU or UMSL.

MATHEMATICS COURSE DESCRIPTIONS

MT ALGEBRA I

Grade 9	1 credit	Year-long course
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This course reinforces the students' experience with rational numbers while introducing the concepts of constant and variable. The student learns to evaluate and simplify algebraic expressions, to solve linear and quadratic equations, to translate word problems into algebraic equations, and to graph linear functions. Other topics include inequalities, natural-number exponents, factorization of polynomials, rational expressions, radicals, and systems of equations. The student learns the "why" as well as the "how" of basic algebraic operations.

Prerequisite: none



MATHEMATICS

MATHEMATICS COURSE DESCRIPTIONS

MT ALGEBRA I ACCELERATED

Grade 9 I credit Year-long course

This course is for the student who has some experience with Algebra I topics but does not show a mastery of the subject. Building on that experience, the instructor will design the course to challenge the students by complementing and extending their knowledge of Algebra I.

Prerequisite: departmental approval

MT GEOMETRY

Grade 10 I credit Year-long course

This course is predominantly a study of the properties of plane figures integrated with some solid geometry. The student uses inductive reasoning as a method of discovery and deductive reasoning as a method of proof. The emphasis on logic and deductive systems develops the structure of geometry, while application problems demonstrate the practical nature of the subject.

Prerequisite: Algebra I or Algebra I Accelerated

MT HONORS GEOMETRY

Grade 9, 10 I credit Year-long course

While covering the same topics as the regular geometry class, this course will take a more theoretical approach to the work as well as covering more difficult problems. The pace of the class will be brisk.

Prerequisite: A or A+ in Algebra I Accelerated and departmental approval

MT ALGEBRA II

Grade 11 I credit Year-long course

This course reviews and extends the topics introduced in Algebra I. It is designed for those students who desire further work in mathematics, but who do not qualify for the more rigorous course in Advanced Algebra II. Topics covered include: real and complex numbers, equations (linear, quadratic, and fractional), systems of equations, inequalities, exponents, polynomials, an introduction to trigonometry, linear functions, and their graphs.

Prerequisite: Algebra I or Algebra I Accelerated, either Geometry or Honors Geometry, and departmental approval

MT ADVANCED ALGEBRA II

Grade 10, 11 I credit Year-long course

In this course, the first semester will reinforce topics covered in Algebra I with an increase in difficulty and depth. Also, absolute value equations, inequalities, and graphs will be covered. Solving, graphing, and analyzing quadratic equations are also discussed. By the end of the semester, students will be able to solve systems of equations in three variables. Second semester will explore trigonometry, equations, inequalities, and graphs of degree two and higher. This will include parabolas and circles, as well as radical, exponential, logarithmic, and rational functions.

Prerequisite: B in Algebra I or Algebra I Accelerated, B in Geometry or Honors Geometry, and departmental approval

MATHEMATICS

MATHEMATICS COURSE DESCRIPTIONS

MT HONORS ALGEBRA II

Grade 9, 10, 11

1 credit

Year-long course

This course will progress at a very fast pace, covering the greatest breadth and depth of topics. Students are expected to have mastered the skills and thoroughly understood the concepts covered in prior courses. They are expected to have retained this past knowledge, which will generally not be reviewed in the course. In addition to the material in Advanced Algebra II, topics such as sequences, transformations, trigonometry, and matrices will also be covered.

Prerequisite: B+ average in Honors Geometry and departmental approval



MT COLLEGE ALGEBRA

Grade 11, 12

1 credit

Year-long course

This is a year-long course which reviews and extends upon the topics introduced in Algebra II. Topics covered include: factoring, complex numbers, rational exponents, simplifying rational functions, functions and their graphs, transformations, inverse functions, solving linear and nonlinear equations and inequalities, polynomial functions, inverse functions, logarithms, exponentials, solutions to systems of linear and nonlinear equations, systems of inequalities, matrices, and rates of change.

Prerequisite: B+ average in Algebra II or Advanced Algebra II and departmental approval

MT PROBABILITY AND STATISTICS

Grade 11, 12

.5 credit

Semester course

This one semester course introduces the student to the fundamental ideas behind statistical methods and to the basic considerations of probability. Data organization and analysis, combinations and permutations, random variables, binomial and normal distributions, and sampling are covered.

Prerequisite: none

MT TRIGONOMETRY

Grade 11, 12

.5 credit

Semester course

This one semester course is designed for the student who has just completed Algebra II. By the completion of this course, students will be able to solve triangles, compute and graph trigonometric functions in both degrees and radians, and prove trigonometric identities. Additional topics may include inverse trig functions, trigonometric equations, and more in-depth trig identities.

Prerequisite: Algebra II and departmental approval

MATHEMATICS

MATHEMATICS COURSE DESCRIPTIONS

MT CALCULUS

Grade 10, 11, 12

1 credit

Year-long course

Topics of this course will include limits, continuity, derivatives, integration, and applications of these topics. Topics will be approached using both analytical and graphing techniques. While not a college credit class, this course will provide a good foundation for taking Calculus in college.

Prerequisite: A average in Advanced Algebra II and departmental approval

MT ACC PRECALULUS

Grade 11, 12

1 credit

Year-long course

Topics of this course include functions, graphs and models, modeling with linear and quadratic functions, trigonometric identities and conditional equations, additional topics in trigonometry, additional topics in analytic geometry, and parametric equations.

Prerequisite: 3.0 GPA, Advanced Algebra II or Honors Algebra II, and departmental approval

Registering for college credit is optional for this course.

Students have the opportunity to earn 3 college credits for this year-long course through SLU: MATH 1400 Precalculus

MT AP/ACP STATISTICS

Grade 11, 12

1 credit

Year-long course

This is a two-semester course that may be taken for college credit. The purpose of this class is to introduce the students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Throughout the year, students are exposed to four main themes: exploring data, sampling and experimentation, anticipating patterns, and statistical inference.

Prerequisite: 3.0 GPA, A average in Advanced Algebra II or B average in Honors Algebra II, and departmental approval

Taking the AP exam, Statistics, is optional for this course.

Students have the opportunity to earn 3 college credits for this year-long course through UMSL: MATH 1320 Introduction to Probability and Statistics

MATHEMATICS

MATHEMATICS COURSE DESCRIPTIONS

MT AP/ACC CALCULUS AB

Grade 10, 11, 12

1 credit

Year-long course

This is a two-semester, college-level course, in which college credit for Calculus I may be earned. Up to four hours of college credit may be earned through St. Louis University's 1818 program, and up to ten hours of college credit may be earned on the AP test. Both the recommended Advanced Placement calculus curriculum and SLU's calculus curriculum are followed throughout the year. This class covers approximately three-fourths of a two-semester college calculus course. The topics included are: limits, continuity, differentiation, integration, and applications of these topics.

Prerequisite: 3.0 GPA for juniors and seniors, 3.5 GPA for sophomores, B+ average in Honors Algebra II, and departmental approval

Taking the AP exam, Calculus AB, is optional for this course.

Registering for college credit is optional for this course.

Students have the opportunity to earn 4 college credits for this year-long course through SLU:

MATH 1510 Calculus I



MT AP/ACC CALCULUS BC

Grade 10, 11, 12

1 credit

Year-long course

This is a two-semester, college-level course, in which college credit for Calculus I and Calculus II may be earned. Up to eight hours of college credit may be earned through St. Louis University's 1818 program. Up to fifteen hours of college credit may be earned on the AP test. Both the recommended Advanced Placement calculus curriculum and SLU's calculus curriculum are followed throughout the year. This class covers more than a two semester college calculus course. All topics in Calculus AB are covered as well as the following topics: advanced techniques of integration, polar equations, improper integrals, parametric equations, vectors, and series. A student who has already taken AP/ACC Calculus AB may sign up for second semester only.

Prerequisite: 3.0 GPA for juniors and seniors, 3.5 GPA for sophomores, A average in Honors Algebra II or AP/ACC Calculus AB, and departmental approval

Taking the AP exam, Calculus BC, is optional for this course.

Registering for college credit is optional for this course.

Students have the opportunity to earn 8 college credits for this year-long course through SLU:

MATH 1510 Calculus I

MATH 1520 Calculus II