

## Mathematics Courses

Four credits of math are required for all Alabama high school diplomas. Those credits must include Algebra I, Geometry and Algebra II at minimum. All Jefferson County students interested in pursuing postsecondary education at a two-year or four-year college or university should take a mathematics course each academic year while they are in high school, regardless of course requirements for graduation.

**Samples of Course Sequences for High School Mathematics**

Pathways	(Grade 8)	Grade 9	Grade 10	Grade 11	Grade 12
<b>1</b>	Algebra I	Geometry or Adv Geometry	Algebra II with Trigonometry or Adv Algebra II with Trigonometry	Pre-Calculus or Adv Pre-Calculus	AP Calculus AB or AP Computer Science or AP Statistics or Algebra with Finance or Discrete Math
<b>2</b>	Mathematics 8 (A or B Average)	Algebra I	Geometry or Adv Geometry	Algebra II with Trigonometry or Adv Algebra II with Trigonometry	Pre-Calculus or Adv Pre-Calculus or AP Computer Science or AP Statistics or Algebra with Finance or Discrete Math
<b>3</b>	Mathematics 8 (C, D or F Average)	Algebra I A (Semester 1) & Algebra I B (Semester 2)	Geometry or Adv Geometry	Algebra II with Trigonometry or Adv Algebra II with Trigonometry	Pre-Calculus or Adv Pre-Calculus or AP Computer Science or AP Statistics or Algebra with Finance or Discrete Math
<b>4</b>	Mathematics 8 (C, D or F Average)	Algebra I A (Semester 1) & Algebra I B (Semester 2)	Geometry	Algebraic Connections	Algebra II or Algebra II with Trigonometry
<b>5 Dual Enrollment</b>	Algebra I	Adv Geometry	Adv Algebra II with Trigonometry	MTH 112 Pre-Calculus Algebra	MTH 113 Pre-Calculus Trigonometry
<b>6 Dual Enrollment</b>	Algebra I	Adv Geometry	Adv Algebra II with Trigonometry	MTH 115 Pre-Calculus Algebra & Trigonometry	MTH 125 Calculus I

<b>7 Essentials Pathway</b>		Algebraic Concepts	Algebraic Essentials or Algebraic Essentials A & B	Geometry Essentials or Geometry Essentials A & B	Essentials Algebra II or Essentials Algebra with Finance
<b>8 Essentials Pathway</b>		Algebraic Essentials A	Algebraic Essentials B	Geometry Essentials	Essentials Algebra II or Essentials Algebra with Finance
<b>9 AAS Pathway</b>		AAS: Math 9	AAS: Math 10	AAS: Math 11	AAS: Math 12

**210005 Algebra I 1 Credit Grade 9**

Algebra I is an extensive study of algebraic properties and operations with the real number system. Students will analyze linear functions graphically, numerically and algebraically. Problem solving situations will require the use of exponents and operations on polynomials, radicals and rational expressions. This course serves as the cornerstone for all high school mathematics courses; therefore, all subsequent mathematics courses require student mastery of the Algebra I content standards. This course is appropriate for students interested in a wide range of postsecondary options.

**Prerequisite(s):** Completion of Math 8 with an A or B average.

**Note:** Fulfills one of the four mathematics credits required for graduation.

**Note:** High school credit may be awarded if this course is taken in Grade 8, but students may waive the credit earned in Grade 8 and take Algebra I as the first high school math course in Grade 9.

**NCAA:** Approved

**Fee:** None

**210008 Algebra I A 1 Credit Grade 9**

Algebra I A is the first part of a formal study of algebraic concepts and the real number system and is approximately one-half of the content of Algebra I. This course is for students who need additional time for extra practice. This course is appropriate for students interested in a wide range of postsecondary options.

**Prerequisite(s):** Completion of Mathematics 8.

**Note:** Algebra I B must be taken as well (preferably in the same academic year) for this course to fulfill one of the four mathematics credits required for graduation.

**NCAA:** Although students earn one full credit for this course, the NCAA will only recognize one-half credit for eligibility.

**Fee:** None

**210009 Algebra I B 1 Credit Grade 10**

Algebra I B is the second part of a formal study of algebraic concepts and the real number system and is approximately one-half of the content of Algebra I. This course is appropriate for students interested in a wide range of postsecondary options.

**Prerequisite(s):** Completion of Algebra I A.

**Note:** Algebra IB must be taken with Algebra IA (preferably in the same academic year) for this course to fulfill one of the four mathematics credits required for graduation.

**NCAA:** Although students earn one full credit for this course, the NCAA will only recognize one-half credit for eligibility.

**Fee:** None

**210010 Geometry 1 Credit Grade 10**

Geometry builds on Algebra I concepts and increases students' knowledge of shapes and their properties through geometry-based application, many of which are observable in aspects of everyday life. This knowledge develops visual and spatial sense and strong reasoning skills. It requires students to make conjectures and to use reasoning to validate or negate these conjectures. The use of proofs and constructions is a valuable tool that enhances



SAT). This course is encouraged for student interested in pursuing postsecondary education at the two-year or four-year level.

**Prerequisite(s):** Completion of Geometry.

**Note:** This course fulfills one of the four mathematics credits required for graduation.

**Summer Assignment:** Yes

**NCAA:** Approved

**Fee:** None

**210017ab Algebra II with Trigonometry Advanced SV 1 Credit Grades 10-12**

Advanced Algebra II with Trigonometry is a rigorous course that builds necessary skills for success in higher-level mathematics. As an advanced course, more content will be taught and the pace will be quicker. This course extends students' knowledge of Algebra I with additional algebraic and trigonometric content. The use of appropriate technology for numerical and graphical investigations enhances students' analytical comprehension. This course provides excellent preparation for success on college admission tests (the ACT and SAT). This course is encouraged for students interested in pursuing postsecondary education at the two-year or four-year level.

**Prerequisite(s):** (1) Completion of Geometry with an A or B OR completion of Advanced Geometry with an A, B, or C; and (2) recommendation of math teacher.

**Additional Quality Point:** +0.5 for a final grade of A, B, C or D in this course.

**Note:** This course fulfills one of the four mathematics credits required for graduation.

**Summer Assignment:** Yes

**NCAA:** Approved

**Fee:** None

**210018 Discrete Mathematics 1 Credit Grade 12**

Discrete Mathematics expands upon the topics of matrices, combinatorial reasoning, counting techniques, algorithms, sequences, series, and their applications. Students are expected to work in both individual and group settings to apply problem-solving strategies and to incorporate technological tools that extend beyond traditional instructional practices. This course is encouraged for students interested in pursuing postsecondary education at the two-year or four-year level.

**Prerequisite(s):** Completion of Algebra II with Trigonometry.

**Note:** This course fulfills one of the four mathematics credits required for graduation.

**Summer Assignment:** Yes

**NCAA:** Approved

**Fee:** None

**210020 Pre-Calculus 1 Credit Grades 11-12**

Pre-Calculus is considered a prerequisite for success in calculus. Algebraic, graphical, numerical, and verbal analyses are incorporated into course standards. Parametric equations, polar relations, vector operations, conic sections, and limits are introduced. Content also includes an expanded study of polynomial and rational functions, trigonometric functions, and logarithmic and exponential functions. Application-based problem solving is an integral part of this course. This course is encouraged for students interested in pursuing postsecondary education at the two-year or four-year level.

**Prerequisite(s):** Completion of Algebra II with Trigonometry or Advanced Algebra II with Trigonometry.

**Note:** This course fulfills one of the four mathematics credits required for graduation.

**Summer Assignment:** Yes

**NCAA:** Approved

**Fee:** None

**210020aa Pre-Calculus Advanced SV 1 Credit Grades 11-12**

Advanced Pre-Calculus is an advanced study of the concepts contained in the Pre-Calculus course. This rigorous course is considered to be a prerequisite for success in Calculus. As an advanced course, more content will be taught and the pace will be quicker. Algebraic, graphical, numerical, and verbal analyses are incorporated into course standards. Parametric equations, polar relations, vector operations and limits are introduced. Content also includes an expanded study of polynomial and rational functions, conic sections, trigonometric functions, and logarithmic

and exponential functions. Application-based problem solving is an integral part of this course. This course is encouraged for students interested in pursuing postsecondary education at the two-year or four-year level.

**Prerequisite(s):** (1) Completion of Advanced Algebra II with Trigonometry with an A, B or C average; and (2) math teacher recommendation.

**Note:** This course fulfills one of the four mathematics credits required for graduation.

**Summer Assignment:** Yes

**Additional Quality Point:** +0.5 for a final grade of A, B, C or D in this course.

**NCAA:** Approved

**Fee:** None

**210025                      Calculus AB AP    1 Credit                      Grade 12**

AP Calculus AB is a rigorous course which is roughly equivalent to a first semester college Calculus course devoted to topics in differential and integral Calculus. AP Calculus AB is structured around three big ideas: limit, derivatives and integrals and the Fundamental Theorem of Calculus. The concept of limits is foundational; the understanding of this fundamental tool leads to the development of more advanced tools and concepts that prepare students to grasp the Fundamental Theorem of Calculus, a central idea of AP Calculus. This course is encouraged for students interested in pursuing postsecondary education at the two-year or four-year level.

**Prerequisite(s):** (1) Completion of Advanced Pre-Calculus with an A, B or C average; and (2) math teacher recommendation.

**Note:** This course fulfills one of the four mathematics credits required for graduation.

**Note:** Students who take this course are expected to take the AP Exam in May for possible college credit. Since colleges vary in acceptable AP scores, students should check with their colleges of interest to determine policies regarding AP credit.

**Additional Quality Point:** +1 if student receives a final grade of A, B, C or D.

**Summer Assignment:** Yes

**NCAA:** Approved

**Fee:** \$20.00

**AP Exam Fee:** Yes

**210027                      Statistics AP    1 Credit                      Grade 12**

AP Statistics is equivalent to a one semester, introductory, non-calculus based college course in statistics. Students are introduced to the major concepts and tools for collecting, analyzing and drawing conclusions from data. There are four themes in AP Statistics: exploring data, sampling and experimentation, anticipating patterns and statistical inference. This course is encouraged for students interested in pursuing postsecondary education at the two-year or four-year level.

**Prerequisite(s):** (1) Completion of Advanced Algebra II with Trigonometry, and (2) teacher recommendation.

**Note:** This course fulfills one of the four mathematics credits required for graduation.

**Note:** Students who take this course are expected to take the AP Exam in May for possible college credit. Since colleges vary in acceptable AP scores, students should check with their colleges of interest to determine policies regarding AP credit.

**Additional Quality Point:** +1 if student receives a final grade of A, B, C or D.

**Summer Assignment:** Yes

**NCAA:** Approved

**Fee:** \$20.00

**AP Exam Fee:** Yes

**210036                      Algebra with Finance    1 Credit                      Grade 12**

Algebra with Finance is a college and career preparatory course that integrates algebra, pre-calculus, probability and statistics, calculus and geometry to solve financial problems that occur in everyday life. Real-world problems in investing, credit, banking, auto insurance, mortgages, employment, income taxes, budgeting and planning for retirement are solved by applying the relevant mathematics that are taught at a higher level. Students are encouraged to use a variety of problem-solving skills and strategies in real-world contexts, and to question outcomes using mathematical analysis and data to support their findings. This course offers students multiple opportunities

to use, construct, question, model, and interpret financial situations through symbolic algebraic representations, graphical representations, geometric representations, and verbal representations. Math concepts and skills are applied through study and problem-solving activities in workforce situations in the following areas: banking, investing, employment and income taxes, automobile ownership and operation, mathematical operations, consumer credit, independent living, and retirement planning and budgeting. This course can replace Algebra II or Algebra II with Trigonometry.

**Prerequisite(s):** Completion of Geometry or Advanced Geometry.

**Note:** This course may be used as the fourth math credit, a substitute for Algebra II, or as an elective.

**NCAA:** Approval Pending

**Fee:** None

**520018                      Computer Science Principles, AP                      1 Credit                      Grades 11-12**

AP Computer Science Principles focuses on the innovative and multidisciplinary aspects of computing as well as the computational thinking practices that help students see how computing is relevant to many areas of everyday life. Students are introduced to the creative aspects of programming, abstractions, algorithms, large data sets, the Internet, cybersecurity concerns and computing impacts.

**Prerequisite(s):** Algebra II with Trigonometry or Advanced Algebra II with Trigonometry

**Note:** This course may be used as one of the four math courses required to earn an Alabama High School Diploma or it may be used as a CTE elective.

**Note:** Students who take this course are expected to take the AP Exam in May for possible college credit. Since colleges vary in acceptable AP scores, students should check with their colleges of interest to determine policies regarding AP credit.

**Additional Quality Point:** +1 if student receives a final grade of A, B, C or D.

**Summer Assignment:** No

**NCAA:** Approval Pending

**Fee:** \$25.00

**AP Exam Fee:** Yes

**Alternate Achievement Standards (AAS): Math**

Some students qualify for AAS: Math courses and are assessed by using alternate achievement standards (Extended Standards) which are aligned to the *Alabama Course of Study*.

**Prerequisite(s):** Permission documented in student's Individualized Education Plan (IEP).

**NCAA:** NOT Approved

**Fee:** None

<b>600459</b>	<b>AAS: Mathematics 9</b>	<b>1 Credit</b>	<b>Grade 9</b>
<b>600460</b>	<b>AAS: Mathematics 10</b>	<b>1 Credit</b>	<b>Grade 10</b>
<b>600461</b>	<b>AAS: Mathematics 11</b>	<b>1 Credit</b>	<b>Grade 11</b>
<b>600462</b>	<b>AAS: Mathematics 12</b>	<b>1 Credit</b>	<b>Grade 12</b>

**Essentials Pathway: Mathematics**

**70015                      Algebraic Concepts                      1 Credit                      Grade 9**

Algebraic Concepts provides students with prerequisite algebra skills identified in the general education math courses. This course includes concepts to prepare students for Algebraic Essentials A and B or Algebraic Essentials.

**Prerequisite(s):** Teacher recommendation.

**NCAA:** NOT Approved

**Fee:** None

**700016 Algebraic Essentials A 1 Credit Grades 9-10**

Algebraic Essentials A provides students with foundational skills identified in the first half of the general education Algebra I course. This course includes essential concepts to equip students with the algebra skills necessary for employment and independent living.

**Prerequisite(s):** Completion of Algebraic Concepts or teacher recommendation.

**NCAA:** NOT Approved

**Fee:** None

**700017 Algebraic Essentials B 1 Credit Grades 9-10**

Algebraic Essentials B provides students with foundational skills identified in the second half of the general education Algebra I course. This course includes essential concepts to equip students with the algebra skills necessary for employment and independent living.

**Prerequisite(s):** Completion of Algebraic Essentials A.

**NCAA:** NOT Approved

**Fee:** None

**700018 Geometry Essentials A 1 Credit Grade 11**

Geometry Essentials A provides students with foundational skills identified in the first half of the general education Geometry course. This course includes essential concepts to equip students with the geometry skills necessary for employment and independent living.

**Prerequisite(s):** Completion of Algebraic Essentials B or Algebraic Essentials.

**NCAA:** NOT Approved

**Fee:** None

**700019 Geometry Essentials B 1 Credit Grade 11**

Geometry Essentials B provides students with foundational skills identified in the second half of the general education Geometry course. This course includes essential concepts to equip students with the geometry skills necessary for employment and independent living.

**Prerequisite(s):** Completion of Geometry Essentials A.

**NCAA:** NOT Approved

**Fee:** None

**750601 Algebraic Essentials 1 Credit Grades 9-10**

Algebraic Essentials provides students with foundational skills identified in the general education Algebra I course. This course includes essential concepts to equip students with the algebra skills necessary for employment and independent living.

**Prerequisite(s):** Completion of Algebraic Concepts or teacher recommendation.

**NCAA:** NOT Approved

**Fee:** None

**750651 Geometry Essentials 1 Credit Grade 11**

Geometry Essentials provides students with foundational skills identified in the general education Geometry course. This course includes essential concepts to equip students with the geometry skills necessary for employment and independent living.

**Prerequisite(s):** Completion of Algebraic Essentials B or Algebraic Essentials.

**NCAA:** NOT Approved

**Fee:** None

**750701 Essentials Algebra II 1 Credit Grade 12**

Essentials Algebra II provides students with foundational skills identified in the general education Algebra II course. The course includes algebra concepts to equip students with more advanced algebra skills necessary for employment and independent living.



**Note:** This course is taught at Jefferson State Community College, Lawson State Community College or The University of Alabama Early College.

**NCAA:** Approved

**Cost:** Yes

**\*Pre-Calculus Trigonometry (MTH 113 or MS 113) 1 Credit Grades 11-12**

**907602 (2-Year College Number)**

**210020ag (4-Year College Number)**

This course includes the study of trigonometric (circular functions) and inverse trigonometric functions, and includes extensive work with trigonometric identities and trigonometric equations.

**Prerequisite(s):** Students must have a minimum prerequisite of high school Algebra I, Geometry and Algebra II; an appropriate mathematics placement score; and a C or higher in Pre-Calculus Algebra.

**Additional Quality Point:** +1 for a final grade of A, B, C or D in this course.

**Note:** This course is taught at Jefferson State Community College, Lawson State Community College or The University of Alabama Early College.

**NCAA:** Approved

**Cost:** Yes

**\*Pre-Calculus Algebra & Trigonometry (MTH 115) 1 Credit Grades 11-12**

**907603 (2-Year College Number)**

**210020ah (4-Year College Number)**

This course is a one semester combination of Precalculus Algebra and Precalculus Trigonometry intended for superior students.

**Prerequisite(s):** Students must have a minimum prerequisite of high school Algebra I, Geometry and Algebra II; an appropriate mathematics placement score; or a C or higher in MTH 100 and receive permission from the department chair.

**Additional Quality Point:** +1 for a final grade of A, B, C or D in this course.

**Note:** This course is taught at Jefferson State Community College or Lawson State Community College.

**NCAA:** Approved

**Cost:** Yes

**\*Calculus I (MTH 125) 1 Credit Grades 11-12**

**907605 (2-Year College Number)**

**210025aa (4-Year College Number)**

This is the first of three courses in the basic calculus sequence taken primarily by students in science, engineering, and mathematics.

**Prerequisite(s):** Students must have a minimum prerequisite of high school Algebra I, Geometry and Algebra II with an appropriate mathematics placement score or a C or higher in MTH 113 or MTH 115.

**Additional Quality Point:** +1 for a final grade of A, B, C or D in this course.

**Note:** This course is taught at Jefferson State Community College or Lawson State Community College.

**NCAA:** Approved

**Cost:** Yes

**Calculus II (MTH 126) 1 Credit Grades 11-12**

**907606 (2-Year College Number)**

**210026ab (4-Year College Number)**

This is the second of three courses in the basic calculus sequence taken primarily by students in science, engineering, and mathematics.

**Prerequisite(s):** Students must have a C or higher in MTH 125.

**Additional Quality Point:** +1 for a final grade of A, B, C or D in this course.

**Note:** This course is taught at Jefferson State Community College or Lawson State Community College.

**NCAA:** Approved

**Cost:** Yes

**Linear Algebra (MTH 237)****1 Credit****Grades 11-12****907609 (2-Year College Number)****210032ae (4-Year College Number)**

This course introduces the basic theory of linear equations and matrices, real vector spaces, bases and dimension, linear transformations and matrices, determinants, eigenvalues and eigenvectors, inner product spaces, and the diagonalization of symmetric matrices.

**Prerequisite(s):** Students must have a C or higher in MTH 126.

**Additional Quality Point:** +1 for a final grade of A, B, C or D in this course.

**Note:** This course is taught at Jefferson State Community College or Lawson State Community College.

**NCAA:** Approved

**Cost:** Yes

**Elementary Statistics (MTH 265 or MS 204)****1 Credit****Grades 11-12****907616 (2-Year College Number)****210027aa (4-Year College Number)**

This course provides an introduction to methods of statistics.

**Prerequisite(s):** Students must have completed MTH 100 or have an appropriate mathematics placement score.

**Additional Quality Point:** +1 for a final grade of A, B, C or D in this course.

**Note:** This course is taught at Jefferson State Community College or Lawson State Community College.

**NCAA:** Approved

**Cost:** Yes