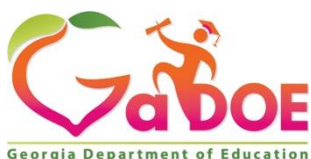




# Graduation Requirement Guidance



Revised: March 2019



# Mathematics Graduation Requirement Guidance

## Table of Contents

<b>Executive Summary .....</b>	<b>3</b>
<b>Section 1: Georgia HS Graduation Requirements .....</b>	<b>5</b>
<b>Section 2: Mathematics Course Sequence Information .....</b>	<b>7</b>
<b>Section 3: Mathematics Dual Enrollment Program .....</b>	<b>10</b>
<b>Section 4: High School Mathematics Course Descriptions .....</b>	<b>13</b>
<b>Section 5: Student Placement for Students Entering Ninth Grade from a Georgia School ..</b>	<b>16</b>
<b>Section 6: Student Transfers .....</b>	<b>18</b>
<b>Section 7: Mathematics Support Guidance for High School Students .....</b>	<b>19</b>
<b>Section 8: Resources Available to Middle School and High School Counselors.....</b>	<b>22</b>
<b>Section 9: Mathematics Frequently Asked Questions.....</b>	<b>23</b>

# Mathematics Graduation Requirement Guidance

## Executive Summary

Successful preparation for both postsecondary education and employment requires learning the same rigorous mathematics content and skills. No longer do students planning to enter the workforce after high school need a different and less rigorous mathematics curriculum than those planning to go to college. (Achieve, Inc., 2004)

In 2007, Georgia's State Board of Education adopted rigorous new graduation requirements effective with the ninth-grade class of 2008. A hallmark of the rule was the elimination of tiered-diploma options where students followed either College Preparatory or Technology/Career coursework. All students are expected to complete a common set of mathematics requirements to earn a regular diploma. The rule specifies certain mathematics courses that all students must take – making rigorous content an expectation for all and not just for some of Georgia's students and ensuring that all students are given the opportunity to choose mathematics courses that could include Advanced Placement, International Baccalaureate, and Dual Enrollment courses. Additionally, the rule encourages active student involvement in selecting mathematics courses based on the students' areas of interest.

The Georgia State Board of Education's 2015 adoption of the Georgia Standards of Excellence (GSE) in mathematics was a significant step toward ensuring that Georgia's K-12 students are prepared to enter the 21<sup>st</sup> century global workplace. **The Standards are intended to be a living work; so as new and better evidence emerges, the Standards will be revised accordingly.** As a natural outgrowth of meeting the charge to define college and career readiness, the Standards define what students should understand and be able to do in their study of mathematics. Georgia's mathematics standards are called Georgia Standards of Excellence for Mathematics (MGSE) and were fully implemented in Kindergarten – High School classrooms in school year 2015-2016.

## MATHEMATICS

The *Standards for Mathematical Practice* represent the habits and attitudes of mathematical thinkers and are integral to the superstructure of GSE mathematics. The practice standards define the way knowledge comes together and is used by students. The *Standards for Mathematical Practice* describe the expertise that mathematics educators at all levels should seek to develop in their students. The practices are as follows:

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

The *Standards for Mathematical Content* offer a balanced combination of procedure and understanding.

A lack of understanding effectively prevents a student from engaging in the mathematical practices. Designers of curriculum, assessment, and professional development should all attend to the need to connect mathematical practice to mathematical content in mathematics instruction.

# Mathematics Graduation Requirement Guidance

Mathematics requirements associated with the graduation rule are currently aligned with the Georgia Standards of Excellence (GSE) for mathematics. A wide range of mathematics courses provide opportunities for students to continue advanced coursework, to take advantage of academic support classes, and to choose special interest courses, depending on individual needs and aspirations. An increased number of students with disabilities now have the opportunity to earn a regular education diploma, thus enabling them to become employed or to go on to postsecondary education. The mathematics graduation requirements associated with the graduation rule, along with state curriculum standards and assessments, will ensure that more students finish school ready to thrive in our knowledge-based, high-skills economy.

## **Key Feature of the State Board of Education Rule 160-4-2-.48 Requirements**

Four units of core credit in mathematics is required, including Coordinate Algebra or Algebra I or the equivalent; Analytic Geometry or Geometry or the equivalent; and Advanced Algebra or Algebra II or the equivalent. Additional core courses needed to complete four credits in mathematics must be chosen from the list of GSE/AP/IB/Dual Enrollment designated courses.

# Mathematics Graduation Requirement Guidance

## Section 1: Georgia HS Graduation Requirements

Four units of credit in mathematics shall be required of all students, to include:

- Coordinate Algebra or Algebra I or the equivalent,
- Analytic Geometry or Geometry or the equivalent,
- Advanced Algebra or Algebra II or the equivalent, and
- One Additional Unit to be selected from the list of GSE/AP/IB/Dual Enrollment designated courses.

NOTE: Accelerated Coordinate Algebra/Analytic Geometry A and Accelerated Analytic Geometry B/Advanced Algebra include the standards of Coordinate Algebra, Analytic Geometry, and Advanced Algebra. At the present time, these are the only equivalent courses for Coordinate Algebra, Analytic Geometry, and Advanced Algebra.

Accelerated Algebra I/Geometry A and Accelerated Geometry B/Algebra II include the standards of Algebra I, Geometry, and Algebra II. At the present time, these are the only equivalent courses for Algebra I, Geometry, and Algebra II.

**Students with disabilities** who earn credit in Coordinate Algebra or Algebra I or the equivalent, along with the associated support course, *and* Analytic Geometry or Geometry or the equivalent, along with the associated support course, may upon the determination through the Individualized Education Program Team meet the mathematics diploma requirements by completing Advanced Algebra or Algebra II or the equivalent, for a total of 3 mathematics core credits. Successful completion of 3 core units of mathematics may not meet the mathematics admission requirements for entrance into a University System of Georgia institution or other post-secondary institution without additional course work.

**Students with disabilities** who were identified prior to enrollment in high school and have a disability affecting mathematics achievement may follow an alternative course sequence to meet the mathematics course requirements of the graduation rule [160-4-2-48](#). The alternate course sequence includes dispensation from completing Advanced Algebra or Algebra II and would allow a student with disabilities earning core credit in Coordinate Algebra or Algebra I and Analytic Geometry or Geometry, along with two other mathematics courses, to satisfy the minimum mathematics requirements for high school graduation. The student must successfully earn course credit, in accordance with this rule for at least two other state-approved mathematics courses, which may include, but are not limited to, Mathematics Support courses. For further detail, please see Guidelines for Georgia State Board of Education Rule [160-5-1-.15](#) AWARDING UNITS OF CREDIT AND ACCEPTANCE OF TRANSFER CREDIT AND/OR GRADES section 2(e).

High school credit for mathematics courses taken in middle school should be awarded only for courses that include concepts and skills based on the GSE in Mathematics for grades 9-12 or those approved by the State Board of Education. All course requirements, including End of Course requirements, must be met prior to granting credit.

High School credit is **not** awarded for courses that address concepts and skills associated with grades K-8.

# Mathematics Graduation Requirement Guidance

## Mathematics Graduation Requirements

Entered Ninth Grade in 2012-2013 and Subsequent Years
Graduation Rule <a href="#">160-4-2-.48</a> and Awarding Units of Credit Rule <a href="#">160-5-1-.15</a>
<b>4 units of core credit in mathematics</b>
<ul style="list-style-type: none"><li>• 1 unit in Coordinate Algebra or Algebra I or the equivalent</li><li>• 1 unit in Analytic Geometry or Geometry or the equivalent</li><li>• 1 unit in Advanced Algebra or Algebra II or the equivalent</li><li>• Support courses are designated as elective courses</li><li>• Additional core mathematics credits must be chosen from the list of GSE/AP/IB/Dual Enrollment designated courses</li></ul>
<b>Students with Disabilities</b> who earn credit in Coordinate Algebra or Algebra I or the equivalent, along with the associated support course, <i>and</i> Analytic Geometry or Geometry or the equivalent, along with the associated support course, may upon determination of the Individualized Education Program Team meet the mathematics diploma requirements by completing Advanced Algebra or Algebra II or the equivalent, for a total of 3 mathematics core credits.
<b>Students with Disabilities</b> , who were identified prior to enrollment in high school and have a disability affecting mathematics achievement, may follow an alternative course sequence to meet the mathematics course requirements of the graduation rule <a href="#">160-4-2-.48</a> . The alternative course sequence includes receiving dispensation from completing Advanced Algebra or Algebra II. The alternative course sequence would allow a <b>student with disabilities</b> earning core credit in Coordinate Algebra or Algebra I and Analytic Geometry or Geometry with two other mathematics courses to satisfy the minimum mathematics requirements for high school graduation.

# Mathematics Graduation Requirement Guidance

## Section 2: Mathematics Course Sequence Information

GRADE	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
				<b>MS Acceleration</b>	<b>MS Acceleration</b>	<b>ES &amp; MS Acceleration</b>
<b>6</b>	Grade 6	Grade 6	Grade 6	Grades 6-8	Grades 6-8	Grades 6-8 <i>Note: Coursework could begin prior to grade 6 for select students.</i>
<b>7</b>	Grade 7	Grade 7	Grade 7			Coordinate Algebra OR Algebra I
<b>8</b>	Grade 8	Grade 8	Grade 8	Coordinate Algebra OR Algebra I	Accelerated Coordinate Algebra/Analytic Geometry A OR Accelerated Algebra I/ Geometry A	Analytic Geometry OR Geometry
<b>9</b>	Foundations of Algebra	Coordinate Algebra OR Algebra I	Accelerated Coordinate Algebra/Analytic Geometry A OR Accelerated Algebra I/ Geometry A	Analytic Geometry OR Geometry	Accelerated Analytic Geometry B/Advanced Algebra OR Accelerated Geometry B/ Algebra II	Advanced Algebra OR Algebra II
<b>10</b>	Coordinate Algebra OR Algebra I	Analytic Geometry OR Geometry	Accelerated Analytic Geometry B/Advanced Algebra OR Accelerated Geometry B/ Algebra II	Advanced Algebra OR Algebra II	Accelerated Pre-Calculus OR AP*, IB**, Dual Enrollment Course Options <i>(degree-level)</i>	Pre-Calculus OR AP*, IB**, Dual Enrollment Course Options <i>(degree-level)</i>
<b>11</b>	Analytic Geometry OR Geometry	Advanced Algebra OR Algebra II	Accelerated Pre-Calculus OR AP*, IB**, Dual Enrollment Course Options <i>(degree-level)</i>	Pre-Calculus OR AP*, IB**, Dual Enrollment Course Options <i>(degree-level)</i>	Fourth Mathematics Course Options*; OR AP*, IB**, Dual Enrollment Course Options <i>(degree-level)</i>	Fourth Mathematics Course Options*; OR AP*, IB**, Dual Enrollment Course Options <i>(degree-level)</i>
<b>12</b>	Advanced Algebra OR Algebra II	Fourth Mathematics Course Options*; OR AP*, IB**, Dual Enrollment Course Options <i>(degree-level)</i>	Fourth Mathematics Course Options*; OR AP*, IB**, Dual Enrollment Course Options <i>(degree-level)</i>	Fourth Mathematics Course Options*; OR AP*, IB**, Dual Enrollment Course Options <i>(degree-level)</i>	Fourth Mathematics Course Options*; OR AP*, IB**, Dual Enrollment Course Options <i>(degree-level)</i>	Fourth Mathematics Course Options*; OR AP*, IB**, Dual Enrollment Course Options <i>(degree-level)</i>

\* Fourth Mathematics Course Options including AP Courses are listed in Chart A<sub>1</sub> on page 8.

\*\* International Baccalaureate Course Options are listed in Chart B on page 9.

# Mathematics Graduation Requirement Guidance

## CHART A<sub>1</sub>: Fourth Mathematics Course Options

	Course Name	Suggested Prerequisite Courses
27.08700	Mathematics of Finance	LEA Flexibility
27.08900	College Readiness Mathematics	Algebra II OR Advanced Algebra <i>NOTE: Course is designed for students who struggled in Algebra II OR Advanced Algebra and plan to enroll in non-STEM post-secondary study.</i>
27.08500	Advanced Mathematical Decision Making	Algebra II OR Advanced Algebra OR Accelerated Geometry B/Algebra II OR Accelerated Analytic Geometry B/ Advanced Algebra
27.08800	Statistical Reasoning	Algebra II OR Advanced Algebra OR Accelerated Geometry B/Algebra II OR Accelerated Analytic Geometry B/ Advanced Algebra
27.07400	AP Statistics	Algebra II OR Advanced Algebra OR Accelerated Geometry B/Algebra II OR Accelerated Analytic Geometry B/ Advanced Algebra
27.08600	Mathematics of Industry and Government	Algebra II OR Advanced Algebra OR Accelerated Geometry B/Algebra II OR Accelerated Analytic Geometry B/ Advanced Algebra
27.09740	Pre- Calculus	Algebra II OR Advanced Algebra OR Accelerated Geometry B/Algebra II OR Accelerated Analytic Geometry B/ Advanced Algebra
27.09770	Accelerated Pre-Calculus	Accelerated Geometry B/Algebra II OR Accelerated Analytic Geometry B/ Advanced Algebra
27.07910	Advanced Finite Mathematics	Pre-Calculus OR Accelerated Pre-Calculus
27.07800	Calculus	Pre-Calculus OR Accelerated Pre-Calculus
27.07200	AP Calculus AB	Pre-Calculus OR Accelerated Pre-Calculus
27.07300	AP Calculus BC	Pre-Calculus OR Accelerated Pre-Calculus
27.05200	History of Mathematics	AP Calculus AB or BC <i>NOTE: May be taken concurrently with AP Calculus; 0.5 elective credit only</i>
27.07700	Multivariable Calculus	AP Calculus BC
27.08000	Engineering Calculus	AP Calculus BC
27.07900	Advanced Mathematical Topics	AP Calculus AB or BC
27.07520	Differential Equations	Multivariable Calculus

## CHART A<sub>2</sub>: Specialized Mathematics Course Options

	Course Name	Suggested Prerequisite Courses
27.04810	Foundations of Algebra	Mathematics Grade 8 <i>NOTE: Student enrollment is limited by <a href="#">eligibility criteria</a>.</i>
27.09000	Technical College Readiness Mathematics	Algebra I + Geometry OR Coordinate Algebra + Analytic Geometry <i>NOTE: Geometry or Analytic Geometry may be offered as a co-requisite course; student enrollment is limited by eligibility requirements</i>



# Mathematics Graduation Requirement Guidance

## CHART B: International Baccalaureate Course Options

	IDA(3) Course Name	IB Mathematics Course Options
27.05240	IB Mathematical Studies – Year Two <i>** (will be deleted in June 2020)</i>	Mathematical Studies Standard Level
27.06130	IB Mathematics – Year Two <i>** (will be deleted in June 2020)</i>	Mathematics Standard Level or Mathematics Higher Level
27.05260	IB Further Mathematics – Year Two <i>** (will be deleted in June 2020)</i>	Further Mathematics Higher Level
27.05310	IB Mathematics: Analysis and Approaches Standard Level (SL) Year One	Mathematics Standard Level
27.05320	IB Mathematics: Analysis and Approaches Standard Level (SL) Year Two	Mathematics Standard Level
27.05330	IB Mathematics: Analysis and Approaches Higher Level (HL) Year One	Mathematics Higher Level
27.05340	IB Mathematics: Analysis and Approaches Higher Level (HL) Year Two	Mathematics Higher Level
27.05350	IB Mathematics: Applications and Interpretation Standard Level (SL) Year One	Mathematics Standard Level
27.05360	IB Mathematics: Applications and Interpretation Standard Level (SL) Year Two	Mathematics Standard Level
27.05370	IB Mathematics: Applications and Interpretation Higher Level (HL) Year One	Mathematics Higher Level
27.05380	IB Mathematics: Applications and Interpretation Higher Level (HL) Year Two	Mathematics Higher Level

Additional information regarding the International Baccalaureate Program and their mathematics course options can be found at <https://www.state.gov/m/dqhr/flo/c21984.htm> and <https://www.ibo.org/programmes/diploma-programme/curriculum/mathematics/>.

For information regarding the latest changes in IB and [the new mathematics IB courses, click HERE](#).

# Mathematics Graduation Requirement Guidance

## Section 3: Mathematics Dual Enrollment Program

Effective 2016-2017, Dual Enrollment (formerly known as MOWR) mathematics courses have been provided unique course codes and titles which demonstrate the college level course and the institution where the courses were completed. For additional clarification, a [Dual Enrollment Mathematics Frequently Asked Questions](#) document can be found at [www.gadoe.org/mathematics](http://www.gadoe.org/mathematics).

High school students are prepared for college level degree courses after mastering the college readiness standards associated with Advanced Algebra or Algebra II. For that reason, there are no Dual Enrollment course equivalents for Algebra II/Advanced Algebra approved. Algebra II or Advanced Algebra is required to meet high school mathematics graduation requirements. All approved Dual Enrollment mathematics courses provide options for meeting the fourth course beyond the Advanced Algebra/Algebra II graduation requirement. Neither College Algebra nor any other college course has been approved as an equivalent of Algebra II/Advanced Algebra.

**NOTES:** Accelerated Coordinate Algebra/Analytic Geometry A and Accelerated Analytic Geometry B/Advanced Algebra include the standards of Coordinate Algebra, Analytic Geometry, and Advanced Algebra. At the present time, these are the only equivalent courses for Coordinate Algebra, Analytic Geometry, and Advanced Algebra.

Accelerated Algebra I/Geometry A and Accelerated Geometry B/Algebra II include the standards of Algebra I, Geometry, and Algebra II. At the present time, these are the only equivalent courses for Algebra I, Geometry, and Algebra II.

Dual Enrollment courses that include content beyond Algebra II/Advanced Algebra may be used to meet the fourth core mathematics requirement for graduation. A variety of mathematics courses are offered through the Dual Enrollment program. It is important for students to speak with their counselors to determine the best placement into college-level mathematics courses. Approved Dual Enrollment mathematics courses can meet mathematics requirements for graduation once the student has completed Algebra II/Advanced Algebra.

It is very important for students to understand that some Dual Enrollment courses are awarded core mathematics credit whereas some courses are awarded mathematics elective credit. Courses that include content beyond Algebra II/Advanced Algebra may be used to meet the fourth core mathematics requirement for graduation. Also, there are some gateway courses (i.e., College Algebra, Mathematical Modeling, and Quantitative Skills and Reasoning) that may or may not have a co-requisite support course offered at the post-secondary level and are designed to prepare students for the mathematics course that will count for their major course of study when pursuing a four-year degree. Depending on the student's major and area of interest, these courses may or may not satisfy the mathematics requirement for the major they are interested in. More information on the college gateway mathematics courses can be found on the [Complete College Georgia](#) webpage.

Additionally, some courses may not meet requirements beyond Algebra II/Advanced Algebra and are therefore not awarded core mathematics credit to meet graduation requirements. For example, diploma-level courses may be awarded mathematics elective credit; however, the TCSG diploma-level courses will not meet high school mathematics graduation requirements.

When students complete courses through the Dual Enrollment program, it is important for the school district/school to ensure that the student's high school transcript is an accurate record of the courses actually taken through the Dual Enrollment program. High school counselors are not expected to match high school course names with college

## Mathematics Graduation Requirement Guidance

courses since Dual Enrollment mathematics courses have unique course codes and authentic course titles. The Dual Enrollment course listed on the student's record should match the course name and code found in the Dual Enrollment Approved Course Directory located on [Gafutures.org](http://Gafutures.org). It is important for the student's academic record to be an accurate reflection of the courses actually completed by students.

Eligible students may pursue the High School Postsecondary Graduation Opportunity associated with the O.C.G.A. 202-149.2 (2015 Senate Bill 2) and State Board of Education Rule 160-4-2-.34 DUAL ENROLLMENT - MOVE ON WHEN READY to meet specific criteria in order to satisfy graduation requirements.

The entry requirements for the Dual Enrollment program in Georgia can be found on the Gafutures website. <https://www.gafutures.org/hope-state-aid-programs/scholarships-grants/dual-enrollment/>. Students must meet the dual enrollment admissions requirements set by the participating postsecondary institution they wish to attend. Each participating postsecondary institution sets its own admissions policies for high school dual enrollment students.

More details about the new Dual Enrollment dual-credit program may be found at [www.gafutures.org](http://www.gafutures.org) and <https://www.gafutures.org/hope-state-aid-programs/scholarships-grants/dual-enrollment/>.

# Mathematics Graduation Requirement Guidance

## CHART C: Dual Enrollment Course Options

All Dual Enrollment Course Options for Mathematics can be found on the Georgia Futures Course Directory at this link:

[https://apps.gsfc.org/securenextgen/dsp\\_accel\\_course\\_listings.cfm](https://apps.gsfc.org/securenextgen/dsp_accel_course_listings.cfm)

GRADE	Option 1 TCSG/ USG/GICA Degree Options (STEM majors)	Option 2 TCSG/ USG/ GICA Degree Options (non-STEM majors)	Option 3 TCSG/ USG/ GICA Degree Options (STEM majors/accelerated)	Option 4 High School Postsecondary Graduation Opportunity Plan (per 2015 Senate Bill 2) TCSG Diploma Options <i>*not accepted for completion of 4-Year Degree Programs</i>	Special Considerations
9	Coordinate Algebra OR Algebra I	Coordinate Algebra OR Algebra I	Analytic Geometry OR Geometry OR Accelerated GSE Coordinate Algebra/Analytic Geometry A	Coordinate Algebra OR Algebra I	There are several other combinations of options available; however, the ones listed in the chart are the most prevalent. When advising students, it is important to keep the Georgia Graduation Rule requirements in mind <sup>3</sup> . Any course listed on the GA Futures Site in the Dual Enrollment Course Directory that includes content beyond GSE Advanced Algebra or GSE Algebra II (with the exception of 2015 SB2 course options) is approved to meet one of the four mathematics credits required in the <a href="#">Georgia Graduation Rule</a> .
10	Analytic Geometry OR Geometry	Analytic Geometry OR Geometry	Advanced Algebra OR Algebra II OR Accelerated GSE Analytic Geometry B/Advanced Algebra	Analytic Geometry OR Geometry	
11	Advanced Algebra OR Algebra II	Advanced Algebra OR Algebra II	DE MATH 1113: Pre-Calculus <sup>***</sup> (NOTE: Students may complete DE MATH 1111: College Algebra <b>WITH</b> either DE MATH 1112: Trigonometry or DE MATH 1113: Pre-Calculus to satisfy this option)	Complete requirements for Dual Enrollment TCSG 2 TCCs <sup>2</sup> , or Technical Diploma <sup>2</sup> , or Associate Degree	
12	DE MATH 1113: Pre-Calculus <sup>***</sup>  (NOTE: Students may complete DE MATH 1111: College Algebra <b>WITH</b> either DE MATH 1112: Trigonometry or DE MATH 1113: Pre-Calculus to satisfy this option)	DE MATH 1114: Introduction to Statistics OR DE MATH 2200/2201/2204/2400: Elementary Statistics OR DE MATH 3314: Math Statistics or any other relevant DE course required for degree/major	Options: DE Linear Algebra, DE Calculus I, DE Calculus II, DE Calculus III, DE Calculus IV, DE Differential Equations, DE Multivariable Calculus or higher	Note: Technical College Readiness Mathematics can be taken to assist students with meeting the requirements to place into the TCSG mathematics courses required to meet SB2 options.	

SBOE Rule on Dual Enrollment (160-4-2-.34): <http://www.gadoe.org/External-Affairs-and-Policy/State-Board-of-Education/SBOE%20Rules/160-4-2-.34.pdf>

<sup>1</sup> Note: Admittance to the dual enrollment course options is based on placement testing at the local college/university level.

<sup>2</sup> Diploma level course options are limited to TCSG diploma and TCC options and will not meet college entry to USG degree programs

<sup>3</sup> To meet requirements per the Georgia Graduation Rule, students must take and pass (1) Coordinate Algebra or Algebra I, (2) Analytic Geometry or Geometry, AND (3) Advanced Algebra or Algebra II along with one additional core mathematics course. There are no equivalent courses available in the dual enrollment course directory for these first three required courses.

**Special Note: It is important to note that when enrolling in Dual Enrollment course options, students must take courses beyond Advanced Algebra/ Algebra II unless they are pursuing the High School Postsecondary Graduation Opportunity Plan offered per 2015 Senate Bill 2.**

# Mathematics Graduation Requirement Guidance

## Section 4: High School Mathematics Course Descriptions

### Georgia Mathematics

Georgia Mathematics focuses on actively engaging the student in the development of mathematical understanding by working independently and cooperatively to solve problems, estimating and computing efficiently, using appropriate tools, concrete models, and a variety of representations, and conducting investigations and recording findings. There is a shift toward applying mathematical concepts and skills in the context of authentic problems and student understanding of concepts rather than merely following a sequence of procedures. In mathematics classrooms, students will learn to think critically in a mathematical way with an understanding that there are many different solution pathways and sometimes more than one right answer in applied mathematics. Mathematics is the economy of information. The central idea of all mathematics is to discover patterns, via reasoning and problem solving, without having to commit the information to memory as a separate fact. It is the reasoned, logical connections that make mathematics coherent. The implementation of the Georgia Standards of Excellence in Mathematics places the expected emphasis on sense-making, problem solving, reasoning, representation, modeling, representation, connections, and communication.

### High School Mathematics Course Descriptions

**Foundations of Algebra (27.04810)** is a first-year high school mathematics course option for students who have completed mathematics in grades 6 – 8 yet will need substantial support to bolster success in high school mathematics. The course is aimed at students who have reported low standardized test performance in prior grades and/or have demonstrated significant difficulties in previous mathematics classes.

**Coordinate Algebra (27.09710)** is the first course in a sequence of three high school courses designed to ensure career and college readiness. The course represents a study of algebra with correlated statistics applications and a bridge to the second course through coordinate geometric topics.

**Accelerated Coordinate Algebra/Analytic Geometry A (27.09750)** is the first course in a sequence of mathematics courses designed to ensure that students are prepared to take higher-level mathematics courses during their high school tenure, including Advanced Placement Calculus AB, Advanced Placement Calculus BC, and Advanced Placement Statistics.

**Algebra I (27.09900)** is the first course in a sequence of three required high school courses designed to ensure career and college readiness. The course represents a discrete study of algebra with correlated statistics applications.

**Accelerated Algebra I/ Geometry A (27.09940)** is the first course in a sequence of mathematics courses designed to ensure that students are prepared to take higher-level mathematics courses during their high school tenure, including Advanced Placement Calculus AB, Advanced Placement Calculus BC, and Advanced Placement Statistics.

**Analytic Geometry (27.09720)** is the second course in a sequence of three high school courses designed to ensure career and college readiness. The course embodies a study of geometry analyzed by means of algebraic operations with correlated probability/statistics applications and a bridge to the third course through algebraic topics.

**Accelerated Analytic Geometry B/Advanced Algebra (27.09760)** is the second course in a sequence of mathematics courses designed to ensure that students are prepared to take higher-level mathematics courses during their high school tenure, including Advanced Placement Calculus AB, Advanced Placement Calculus BC, and Advanced Placement Statistics.

## Mathematics Graduation Requirement Guidance

**Geometry (27.09910)** is the second course in a sequence of three required high school courses designed to ensure career and college readiness. The course represents a discrete study of geometry with correlated statistics applications.

**Accelerated Geometry B/Algebra II (27.09950)** is the second course in a sequence of mathematics courses designed to ensure that students are prepared to take higher-level mathematics courses during their high school tenure, including Advanced Placement Calculus AB, Advanced Placement Calculus BC, and Advanced Placement Statistics.

**Advanced Algebra (27.09730)/ Algebra II (27.09920)** is the third course in a sequence of three high school courses designed to ensure career and college readiness. It is designed to prepare students for fourth course options relevant to their career pursuits.

**Technical College Readiness Mathematics (27.09000)** is a mathematics course option for students who have passed Algebra I/ Coordinate Algebra, have passed or are concurrently enrolled in Geometry/Analytic Geometry while taking this course, and intend to enroll in a technical college program. The course is designed for students who have experienced difficulty in passing middle school mathematics End of Grade (EOG) assessments, have struggled significantly in the first two high school core mathematics courses, and have scored less than 229 on the Arithmetic Next Generation ACCUPLACER Placement Assessment. To recognize the struggle of students in high school algebra, students may also qualify if they received a Beginning Learner or Developing Learner designation on the Coordinate Algebra/Algebra I End of Course assessment. This course is designed to assist students in meeting the required ACCUPLACER score to test into mathematics course options required to complete the requirements of the High School Postsecondary Graduation Opportunity associated with the O.C.G.A. 202-149.2 (2015 Senate Bill 2).

**Pre-Calculus (27.09740)** is a fourth mathematics course option designed to follow the completion of Algebra II, Advanced Algebra, Accelerated Geometry B/Algebra II, or Accelerated Analytic Geometry B/Advanced Algebra, which prepares students for calculus and other higher-level mathematics courses.

**Accelerated Pre-Calculus (27.09770)** is the third course in a sequence of mathematics courses designed to ensure that students are prepared to take higher-level mathematics courses during their high school tenure, including Advanced Placement Calculus AB, Advanced Placement Calculus BC, and Advanced Placement Statistics.

**Mathematics of Finance (27.08700)** is a fourth course option which concentrates on the mathematics necessary to understand and make informed decisions related to personal finance. The mathematics in the course is based on many topics in prior courses; however, the specific applications will extend the student's understanding of when and how to use these topics.

**College Readiness Mathematics (27.08900)** is a fourth mathematics course option for students who have completed Algebra II or Advanced Algebra but are still struggling with high school mathematics standards essential for success in first year post-secondary mathematics courses required for non-STEM majors. The course is designed to serve as a bridge for high school students who will enroll in non-STEM post-secondary study.

**Advanced Mathematical Decision Making (27.08500)** is a fourth course option designed to follow the completion of Algebra II, Advanced Algebra, Accelerated Geometry B/Algebra II, or Accelerated Analytic Geometry B/Advanced Algebra, which offers further experiences with statistical information and summaries, methods of designing and conducting statistical studies, data modeling, basic financial decisions, and network models for making informed decisions.

# Mathematics Graduation Requirement Guidance

**Statistical Reasoning (27.08800)** is a fourth mathematics course option for students who have completed Algebra II, Advanced Algebra, Accelerated Geometry B/Algebra II, or Accelerated Analytic Geometry B/Advanced Algebra, which offers opportunities to strengthen the understanding of the statistical method of inquiry and statistical simulations.

**Mathematics of Industry and Government (27.08600)** is a fourth course option designed to follow the completion of Algebra II, Advanced Algebra, Accelerated Geometry B/Algebra II, or Accelerated Analytic Geometry B/Advanced Algebra, which focuses on the development of mathematical models that can be used to model, improve, predict, and optimize real-world systems. These mathematical models include both deterministic models such as mathematical programming, routing, or network flows, and probabilistic models such as queuing, and simulation.

**Advanced Finite Mathematics (27.07910)** is a fourth course option for students who have completed Pre-Calculus or Accelerated Pre-Calculus and will pursue careers which require the mastery of discrete mathematics topics often associated with modern computer science. The course will examine mathematics in four areas through the lens of both pure and applied mathematics: set theory, number theory, probability/combinatorics, and graph theory.

**Calculus (27.07800)** is a fourth mathematics course option for students who have completed Pre-Calculus or Accelerated Pre-Calculus. The course includes problem solving, reasoning and estimation, functions, derivatives, application of the derivative, integrals, and application of the integral.

**Advanced Mathematical Topics (27.07900)** is a mathematics option for students who have completed AP Calculus AB or AP Calculus BC. The course offers an introduction to advanced mathematical topics including logic and set theory, combinatorics, differential equations, and mathematical proofs, to be presented through an abstract approach which characterizes upper level mathematics courses.

**Multivariable Calculus (27.07700)** is a mathematics option for students who have completed AP Calculus BC. It includes three-dimensional coordinate geometry; matrices and determinants; eigenvalues and eigenvectors of matrices; limits and continuity of functions with two independent variables; partial differentiation; multiple integration; the gradient; the divergence; the curl; Theorems of Green, Stokes, and Gauss; line integrals; integrals independent of path; and linear first-order differential equations.

**Differential Equations (27.07520)** is an option for students who wish to enroll in a mathematics course beyond Multivariable Calculus. The course provides an introduction to ordinary differential equations. Topics include the solution of first, second, and higher order differential equations, systems of differential equations, series solutions and Laplace transforms. There will be a strong focus on the presentation of mathematical ideas through both written and oral communication. The goal is to give students the skills and techniques they will need as they study advanced mathematics at the college level.

**Engineering Calculus (27.08000)** is a mathematics option for students who have completed AP Calculus BC. The course provides students with opportunities to develop an understanding of multivariable calculus as it applies to engineering systems, the history of engineering, and its contributions to society. The course includes three-dimensional coordinate geometry; matrices and determinants; limits and continuity of functions with two independent variables; partial differentiation; multiple integration; the gradient; the divergence; the curl; Theorems of Green, Stokes, and Gauss; line integrals; integrals independent of path; and linear first-order differential equations.

**History of Mathematics (27.05200)** is a one-semester **elective** course option for students who have completed AP Calculus or are taking AP Calculus concurrently. It traces the development of major branches of mathematics throughout history, specifically algebra, geometry, number theory, and methods of proofs, how the needs of various cultures influenced that development, and how the mathematics, in turn, influenced culture. The course extends the

# Mathematics Graduation Requirement Guidance

numbers and counting, algebra, geometry, and data analysis and probability strands from previous courses, and includes a new history strand.

## Section 5: Student Placement for Students Entering Ninth Grade from a Georgia School

Determination of course placement should depend on the student's interest in mathematics and/or related fields of study and on the student's achievement in mathematics.

Students who have successfully completed mathematics in grades 6 – 8 have mastered the content necessary to be successful in **Algebra I or Coordinate Algebra**.

The Georgia mathematics program of study provides the opportunity for students with an interest and desire to study mathematics to challenge themselves by taking the more rigorous courses **Accelerated Algebra I/ Geometry A** or **Accelerated Coordinate Algebra/Analytic Geometry A**. Given the alignment of the standards, students who have difficulty in the accelerated mathematics sequence will be able to transition easily to the regular mathematics sequence. As the pace and rigor of accelerated mathematics courses is significantly more challenging than that of the regular mathematics sequence, students placed in an accelerated mathematics course should have strong mathematical skills and an interest in pursuing Advanced Placement or other higher-level mathematics courses while still in high school. Schools should consider equity and access for all when assigning students to the accelerated mathematics sequence of courses.

Students who will require **additional** support for success in Algebra I or Coordinate Algebra are best served through placement in **Algebra I Support or Coordinate Algebra Support** concurrent with enrollment in Algebra I or Coordinate Algebra. Students should be enrolled in mathematics support courses based on local system criteria for identifying students who are at risk for failing mathematics. Students who are *placed* in high school and have not passed the grade 8 math state assessment should certainly be afforded the benefit of a support course. Other criteria might include teacher recommendation based on student performance in the previous or current mathematics course, prior retention, a failing grade in a mathematics course, and/or low scores on the mathematics component of the state assessment or other instruments used by the system to predict success.

Students who have completed mathematics in grades 6 – 8 but will need **substantial** support to bolster success in high school mathematics should be considered for enrollment in the **Foundations of Algebra** course prior to enrollment in Algebra I or Coordinate Algebra.

The local school or system will determine the criteria for placing students in appropriate mathematics courses.

### Placement Decision Considerations

- Placement in high school mathematics courses is dependent upon assessment of student knowledge from the transfer school.
- Students should be evaluated by a mathematics instructor with a thorough understanding of the content.
- After using the identified strengths to place the student in the appropriate course, identified weaknesses should be addressed through supplementary lessons that emphasize pre-requisite content knowledge. These lessons can be delivered through the mathematics support courses or through independent work.



## Mathematics Graduation Requirement Guidance

- Students needing extensive remediation on middle grades topics should be considered for placement in **Foundations of Algebra**.

This course can be offered to students who have struggled significantly in middle school mathematics courses. Schools can use the following criteria to identify students for the course:

- Score at the Beginning Learner level on the 7th grade math Milestones EOG assessment, or
  - Score at the Beginning Learner level on the 8th grade math Milestones EOG assessment, or
  - Failed Algebra I or Coordinate Algebra and scored at the Beginning Level on the EOC assessment at the end of the course.
- To allow for students who need significant math support but who do not meet the above criteria, schools have the option to enroll up to an additional 3% of first-time 9th graders who did not take a high school math course in middle school. These spaces should be reserved for students, with or without prior Milestones scores, who have significant math deficiencies as identified by a district diagnostic assessment.
  - Students who qualify according to the above criteria may be offered the opportunity to take Foundations of Algebra as one of the four required mathematics units of credit for high school graduation. However, qualifying students should not be required to take the Foundations course and should carefully consider teacher recommendations, planned postsecondary enrollments, and all other factors in making the decision to take Foundations of Algebra.
- Students requiring additional support for success in high school mathematics courses are best served through placement in **support courses concurrent with core course enrollment**.
  - Students who have experienced difficulty in passing middle school mathematics End of Grade (EOG) assessments, have struggled significantly in the first two high school core mathematics courses, have scored less than 229 on the Arithmetic ACCUPLACER Placement Assessment OR received a Beginning Learner or Developing Learner designation on the Coordinate Algebra/Algebra I End of Course assessment, and intend to enroll in a technical college program should be considered for placement in **Technical College Readiness Mathematics**.
  - Students who exit high school having completed sequences through Algebra II or Advanced Algebra may have limited post-secondary options. Parents should be thoroughly advised of the consequences of their student graduating with only Algebra I through Algebra II credit or Coordinate Algebra through Advanced Algebra credit.
  - During the advisement session, fourth year mathematics options should be discussed and clarified, and opportunities including summer courses, virtual courses, and other available resources explained.
  - Students who will pursue post-secondary non-STEM study and have completed Algebra II or Advanced Algebra but are still struggling with high school standards essential for success in first year post-secondary mathematics courses required for non-STEM majors, should be considered for enrollment in **College Readiness Mathematics** to meet the fourth mathematics core course graduation requirement.

# Mathematics Graduation Requirement Guidance

## Section 6: Student Transfers

### Student Placement for Students Transferring into Georgia Schools from Out-of-State Schools

Because the *content* of courses with similar names can vary significantly, it is crucial that the transcripts of students entering Georgia high schools from other states or countries with existing credit in high school mathematics courses be examined and that the students' mathematics proficiency be assessed. In every case, students' transcripts should be carefully evaluated and compared to Georgia course content; placement assessments are appropriate as needed. Students' interest and levels of achievement (grades) should also be considered when making a placement decision.

### Transfer Credit

Existing mathematics credits granted by out-of-state schools must be transferred as mathematics credit. Pursuant to State Board of Education Rule 160-5-1-.15 section (2)(a), "Local boards of education shall accept student course credit earned in an accredited school." In paragraph (2)(a)1, "A local board of education shall not substitute courses and exempt students from the required secondary minimum core curriculum...unless the student transferred from an accredited secondary school...". State Board of Education Rule 160-5-1-.15 AWARDING UNITS OF CREDIT AND ACCEPTANCE OF TRANSFER CREDIT AND/OR GRADES can be found at: <http://www.gadoe.org/External-Affairs-and-Policy/State-Board-of-Education/SBOE%20Rules/160-5-1-.15.pdf>.

### Military Transfer Law

In 2009, O.C.G.A. § 20-2-2130 through 20-2-2170 which pertain to the transfer and placement of children of military families in Georgia public schools were added to Georgia State Law. Among other provisions, the law requires that the local school system shall initially honor placement of the student in educational courses based on the student's enrollment in the sending state school or educational assessments conducted at the school in the sending state if the courses are offered. Course placement includes but is not limited to honors, international baccalaureate, advanced placement, vocational, technical, and career pathways courses. Continuing the student's academic program from the previous school and promoting placement in academically and career challenging courses should be paramount when considering placement. Additionally, local school systems shall have flexibility in waiving course or program prerequisites or other preconditions for placement in courses and programs offered by the local school system.

### Student Placement for Students Transferring out of Georgia Schools

Content descriptions (provided on pages 13-15) for all completed high school mathematics courses need to accompany transcripts of students transferring out of Georgia schools.

# Mathematics Graduation Requirement Guidance

## Section 7: Mathematics Support Guidance for High School Students

We are dedicated to providing appropriate support for all students to ensure their successful completion of core academic high school mathematics coursework. There are support courses offered not only for ninth grade students, but also students in every other grade level. The purpose of mathematics support courses is to address the needs of students who have traditionally struggled in mathematics by providing the additional time and attention they need.

The **Foundations of Algebra** course was developed to meet the needs of high school students who have completed mathematics in grades 6 – 8 yet will need **substantial** support to bolster success in high school mathematics. The course is aimed at students who have reported low standardized test performance in prior grades and/or have demonstrated significant difficulties in previous mathematics classes. For information regarding enrollment criteria, please see the placement decision considerations on page 16. Teacher resources for the course can be found at <https://www.georgiastandards.org/Georgia-Standards/Pages/Math-9-12.aspx>. Students who successfully complete the course will be awarded one **core** mathematics credit.

Also available for **additional** and ongoing student support are **Mathematics Support** courses which are taught concurrently with a student's core academic mathematics course. Support courses are awarded elective credit. **Support courses can be retaken for additional elective credit if students retake core academic mathematics courses in which they were not initially successful and choose to retake the associated support course.**

### How should students be selected to be enrolled in mathematics support courses?

Students who are *placed* in high school and have not passed middle school math state assessments should certainly be afforded the benefit of a support course. Other criteria might include teacher recommendation based on student performance in the previous or current mathematics course, prior retention, a failing grade in a mathematics course, and/or low scores on the mathematics component of state assessments, high school mathematics assessment, or other instruments used by the system to predict success.

Students are enrolled in **Mathematics Support Courses**, for Algebra I, Coordinate Algebra, Geometry, Analytic Geometry, Algebra II, and Advanced Algebra, based on local system criteria for identifying students who are at risk for failing mathematics.

### Who should teach mathematics support courses?

Mathematics support courses should be taught by a certified mathematics teacher, preferably one with an understanding of growth mindset in mathematics and demonstrated experience in effectively differentiating instruction to meet the needs of struggling students. If English Learners are being served in a mathematics support course, it is recommended that the teacher also hold the ESOL endorsement. The mathematics support teacher should work closely with the teacher(s) teaching the associated core mathematics course to align content, instruction, and assessments.

### How important is collaboration among teachers to the success of students enrolled in mathematics support courses?

Teachers of the mathematics support courses and the academic core mathematics courses, including collaborative English Learner (EL) and special education teachers, share the responsibility for students' mathematical achievement. In fact, all teachers who instruct students who are enrolled in mathematics support courses should consistently and frequently engage in communication which focuses on:

- individual student progress, including grades, strengths and weaknesses based on standards mastery, mathematical disposition, and work habits;

# Mathematics Graduation Requirement Guidance

- curriculum expectations, including specific standards to be addressed based on a timeline, prerequisite skills, vocabulary, and potential misconceptions;
- instructional strategies, including specific strategies for teaching math concepts that are being used to provide consistency and understanding for teachers and students;
- differentiation of instruction;
- formative and summative assessments, including content and formats that are being used to evaluate students for specific standards.

## What are the critical components of mathematics support courses?

- Students enrolled in every mathematics course should be assessed frequently and appropriate interventions should be made available – the goal being readiness for the next course offered in the sequence.
- The **Mathematics Support** course should focus on mastery of the standards being taught in the associated core academic mathematics course, and not on general content from elementary or middle school.
- All students in a particular **Mathematics Support** course should be enrolled in the same core mathematics course. (i.e., students enrolled in Coordinate Algebra Support will all be enrolled in Coordinate Algebra).
- Grading practices should emphasize mastery of standards through the frequent use of aligned quizzes and tests, both formative and summative.
- Continual progress monitoring should be used to assess and diagnose each student's strengths and weaknesses, based on the standards of the associated core academic mathematics course, and to provide appropriate interventions.
- Opportunities should be provided for students to review content with a focus on standards not previously mastered.
- Opportunities should be provided for students to preview the mathematical concepts associated with the subsequent or concurrent core academic mathematics course. Attention needs to be given to prerequisite skills and concepts and to the vocabulary of the current course.
- The academic language of mathematics should be explicitly taught as concepts are introduced and reinforced.
- Proven strategies for success in mathematics should be utilized on a daily basis. Students should be engaged in doing mathematics, explaining their thinking, and justifying their work. Multiple representations of concepts (tables, charts, graphs, verbal descriptions) should be used as often as possible.
- There should be strong emphasis on building a positive disposition toward learning mathematics.
- Although there is no class size requirement for the mathematics support courses, a reduced class size is recommended.

## How will students be evaluated in mathematics support courses?

The goal of a mathematics support course is to assist students in the successful completion of subsequent and/or associated core academic mathematics course. Assignments, quizzes and tests should be aligned to the standards being taught in Foundations of Algebra or in the associated core academic course. Individuals should be given multiple opportunities to show mastery of the content.

In Mathematics Support courses, opportunities to demonstrate mastery of material first addressed in the associated core academic mathematics course should be provided. Mathematics support provides the time some students need for additional practice or re-testing. The value of formative assessment and feedback cannot be overstated. Continuous progress monitoring with both feedback and commentary is essential in support courses. **Students should not feel pressure to “make grades” as much as they should be motivated and encouraged to master standards.** Documented continuous communication with students on an individual basis is the most appropriate way to maintain records of progress.

## Will schools be able to receive Remedial Education Program (REP) for students enrolled in support courses?

REP can support funding for the Foundations of Algebra and Mathematics Support courses if REP guidelines for eligibility, scheduling, and class size are followed.

# Mathematics Graduation Requirement Guidance

## CHART D: Mathematics Support Course Options

	<b>IDA(3) Course Name</b>	<b>Concurrent Course Enrollment</b>
27.09810	GSE Coordinate Algebra Support	GSE Coordinate Algebra
27.09970	GSE Algebra I Support	GSE Algebra I
27.09820	GSE Analytic Geometry Support	GSE Analytic Geometry
27.09980	GSE Geometry Support	GSE Geometry
27.09830	GSE Advanced Algebra Support	GSE Advanced Algebra
27.09990	GSE Algebra II Support	GSE Algebra II

# Mathematics Graduation Requirement Guidance

## Section 8: Resources Available to Middle School and High School Counselors

- Dr. Lya Snell, Mathematics Program Manager  
[lsnell@doe.k12.ga.us](mailto:lsnell@doe.k12.ga.us)
- Brooke Kline, Mathematics Secondary Program Specialist  
[bkline@doe.k12.ga.us](mailto:bkline@doe.k12.ga.us)
- Mike Wiernicki, Mathematics Elementary Program Specialist  
[mwiernicki@doe.k12.ga.us](mailto:mwiernicki@doe.k12.ga.us)
- GaDOE Mathematics Program Webpage  
<http://www.gadoe.org/Mathematics>
- GaDOE GeorgiaStandards.org Mathematics Website  
<https://www.georgiastandards.org/Georgia-Standards/Pages/Math.aspx>
- State-Funded List of K-8 Subjects and 9-12 Courses  
<https://www.gadoe.org/Curriculum-Instruction-and-Assessment/Curriculum-and-Instruction/Documents/State-Funded-List-of-Subjects-and-Courses-Supported-by-SBOE-Rule-160-4-2-20.pdf>
- Georgia High School Graduation Rule  
<https://www.gadoe.org/External-Affairs-and-Policy/State-Board-of-Education/SBOE%20Rules/160-4-2-.48.pdf>
- Awarding Units of Credit and Acceptance of Transfer Credit and/or Grades Rule  
<http://www.gadoe.org/External-Affairs-and-Policy/State-Board-of-Education/SBOE%20Rules/160-5-1-.15.pdf>
- SWD High School Mathematics Decision Rubric  
<http://www.gadoe.org/Curriculum-Instruction-and-Assessment/Curriculum-and-Instruction/Documents/Mathematics/SWD-High-School-Mathematics-Decision.pdf>
- Dual Enrollment Rule  
<http://www.gadoe.org/External-Affairs-and-Policy/State-Board-of-Education/SBOE%20Rules/160-4-2-.34.pdf>
- Staying On Course: University System of Georgia (USG) High School Curriculum Requirements  
[http://www.usg.edu/assets/student\\_affairs/documents/Staying\\_on\\_Course.pdf](http://www.usg.edu/assets/student_affairs/documents/Staying_on_Course.pdf)
- Technical College System of Georgia (TCSG) Dual Enrollment Information  
<https://doublethecredit.org/>
- Georgia Independent College Association Dual Enrollment Information  
<http://www.georgiacolleges.org/media/de>
- Dual Enrollment Frequently Asked Questions  
<http://www.gadoe.org/Curriculum-Instruction-and-Assessment/Curriculum-and-Instruction/Documents/Mathematics/Dual-Enrollment-Mathematics-FAQs.pdf>
- Technical College Readiness Mathematics Frequently Asked Questions  
<http://www.gadoe.org/Curriculum-Instruction-and-Assessment/Curriculum-and-Instruction/Documents/Mathematics/FAQs-Technical-College-Readiness-Math.pdf>

# Mathematics Graduation Requirement Guidance

## Section 9: Mathematics Frequently Asked Questions

- 1. Where can a Georgia student take a high school mathematics course if it is not offered at the local school?**

Students can take high school mathematics courses through virtual programs, such as Georgia Virtual School, when the course is not offered at the local school. Additional details and information about Georgia Virtual School can be found here: <https://gavirtualschool.org/>.

- 2. Can a student with disabilities meet the mathematics graduation requirements after taking and passing Algebra I or Coordinate Algebra, Geometry or Analytic Geometry, and the associated support classes for both (which is a total of 4 mathematics courses)?**

Yes. Students with disabilities, who were identified prior to enrollment in high school and have a disability affecting mathematics achievement, may follow an alternate course sequence to meet the mathematics course requirements of the graduation rule [160-4-2-.48](#). Alternate course sequences would allow a student with disabilities earning core credit in Coordinate Algebra or Algebra I AND Analytic Geometry or Geometry and at least two other state-approved mathematics courses, which may include, but are not limited to, the associated Mathematics Support courses to satisfy the minimum mathematics requirements for high school graduation. The [High School Mathematics Decision Rubric](#) is required to be used to help an Individualized Education (IEP) Program Team determine the best course programming options for eligible students.

- 3. Can a student with disabilities, who was not identified as having a disability affecting mathematics achievement prior to enrolling in high school, meet graduation requirements after taking and passing Algebra I or Coordinate Algebra, Geometry or Analytic Geometry, and the associated support classes for both (which does not include course credit in Algebra II or Advanced Algebra)?**

No. Students with disabilities, who were NOT identified prior to enrollment in high school and have a disability affecting mathematics achievement, may follow an alternate course sequence to meet the mathematics course requirements of the graduation rule [160-4-2-.48](#). In this case, students with disabilities who earn credit in Coordinate Algebra or Algebra I or the equivalent, along with the associated support course, and Analytic Geometry or Geometry or the equivalent, along with the associated support course, may upon determination of the Individualized Education Program Team meet the mathematics diploma requirements by completing Advanced Algebra or Algebra II or the equivalent, for a total of 3 mathematics core credits.

- 4. Can Technical College Readiness Mathematics be taken in lieu of Algebra II/Advanced Algebra for students pursuing a regular high school diploma?**

No. Algebra II/Advanced Algebra is required to meet high school graduation requirements per the Georgia Department of Education [Graduation Rule](#) (160-4-2-.48).

- 5. If a student takes high school course work prior to enrolling in high school, does that credit have to show up on the high school transcript to certify a student as a Georgia graduate?**

Students need four core units of mathematics credit to meet graduation requirements. Deciding whether to include high school courses taken in middle school on a high school transcript is a district-level decision. If the high school courses are not a part of the student's high school transcript, then the student would need an additional four core units of mathematics to meet graduation requirements.

## Mathematics Graduation Requirement Guidance

- 6. If a student transfers to a Georgia school or enters a Georgia school with credit for courses higher than Algebra I/Coordinate Algebra, Geometry/Analytic Geometry, and/or Algebra II/Advanced Algebra, will they be required to go back and take one of those required courses to meet graduation requirements outlined in the rule?**

In general, students will need credit in Algebra I OR Coordinate Algebra, Geometry OR Analytic Geometry, Algebra II OR Advanced Algebra, and a fourth mathematics course option to meet high school mathematics graduation requirements. However, when a higher-level course is taken and passed indicating that the student demonstrates mastery of content beyond Algebra II/Advanced Algebra, then the student should continue to move forward with the trajectory of taking higher-level mathematics courses instead of going back to take one of the first three required courses missing in their academic record. The higher-level course can satisfy that requirement. Below are a few very rare scenarios for transfer students who have participated in accelerated course sequences that would meet high school graduation requirements.

<b>EXAMPLE SCENARIOS (NOT ALL INCLUSIVE)</b>				
Prior to high school and <i>not included on transfer transcript</i>	Algebra 1 credit completed in middle school but the course is not included on the high school transcript	Algebra I/ Coordinate Algebra AND Geometry or Analytic Geometry	Accelerated Algebra I/ Geometry A	Algebra I/ Coordinate Algebra AND Geometry or Analytic Geometry
Four high school course credits earned to satisfy graduation	1. Geometry or Analytic Geometry	1. Algebra II or Advanced Algebra	1. Accelerated Geometry B/ Algebra II	1. Algebra II or Advanced Algebra
	2. Advanced Algebra or Algebra II	2. Pre-Calculus	2. Accelerated Pre-Calculus	2. Pre-Calculus
	3. Pre-Calculus	3. AP Calculus	3. DE Calculus I	3. College Calculus I
	4. AP Calculus OR AP Statistics	4. Multi-Variable Calculus	4. AP Statistics	4. College Calculus II

- 7. Which high school mathematics courses are accepted by NCAA?**

NCAA requires students to complete 16 core courses, including three years of mathematics (Algebra 1 or higher). Students who earn mathematics core credits in the three courses required by the [Georgia Graduation Rule](#), Algebra I or Coordinate Algebra, Geometry or Analytic Geometry, and Algebra II or Advanced Algebra, for a total of three core credits, will meet [eligibility requirements for NCAA](#). To earn a high school diploma in Georgia, students need to earn core credit in four mathematics courses for graduation. It is up to each local school to submit courses offered at the school for NCAA eligibility through their approval process. More information can be found here: [NCAA Approval Process](#).

- 8. Which mathematics courses are included on the HOPE rigor list?**

The mathematics courses included on the HOPE rigor list can be found [here](#).

- 9. Is Mathematics of Finance accepted by USG as a fourth mathematics course?**

No. USG has not included Mathematics of Finance as an acceptable fourth mathematics course. Please find additional details in the [USG Document, \*Staying on Course: The Required High School Curriculum\*](#).



## Mathematics Graduation Requirement Guidance

**10. Is Foundations of Algebra accepted by USG as a fourth mathematics course?**

No. USG has not included Foundations of Algebra as an acceptable fourth mathematics course. Please find additional details in the [USG Document, \*Staying on Course: The Required High School Curriculum\*](#).

**11. Is Technical College Readiness Mathematics accepted by USG as a fourth mathematics course?**

No. USG has not included Technical College Readiness Mathematics as an acceptable fourth mathematics course. Please find additional details in the [USG Document, \*Staying on Course: The Required High School Curriculum\*](#).

**12. Can computer science courses count as a fourth mathematics credit towards a high school diploma in Georgia?**

A core mathematics credit can be awarded for successful completion of a [designated Computer Science course](#). This credit can be used to satisfy the fourth mathematics graduation requirement. It is important to note that these Computer Science courses do not meet the fourth mathematics admission requirement for USG post-secondary institutions.

**13. Can a student take courses through the Dual Enrollment program if he/she has not completed Algebra II or Advanced Algebra?**

No. Students should have earned credit in Algebra II/Advanced Algebra prior to enrolling in Dual Enrollment mathematics courses.

**14. For Dual Enrollment, can College Algebra, College Mathematical Modeling, or College Quantitative Skills & Reasoning be taken in lieu of Algebra II/Advanced Algebra for students pursuing a regular high school diploma?**

No. The college-level gateway courses, College Algebra, College Mathematical Modeling, and College Quantitative Skills and Reasoning are not considered equivalent to Algebra II nor Advanced Algebra; therefore, these courses shall not be substituted for this graduation requirement.