Pathways to Mathematics Postsecondary Success

Understanding Georgia's Mathematics Graduation Requirements

December 5, 2023
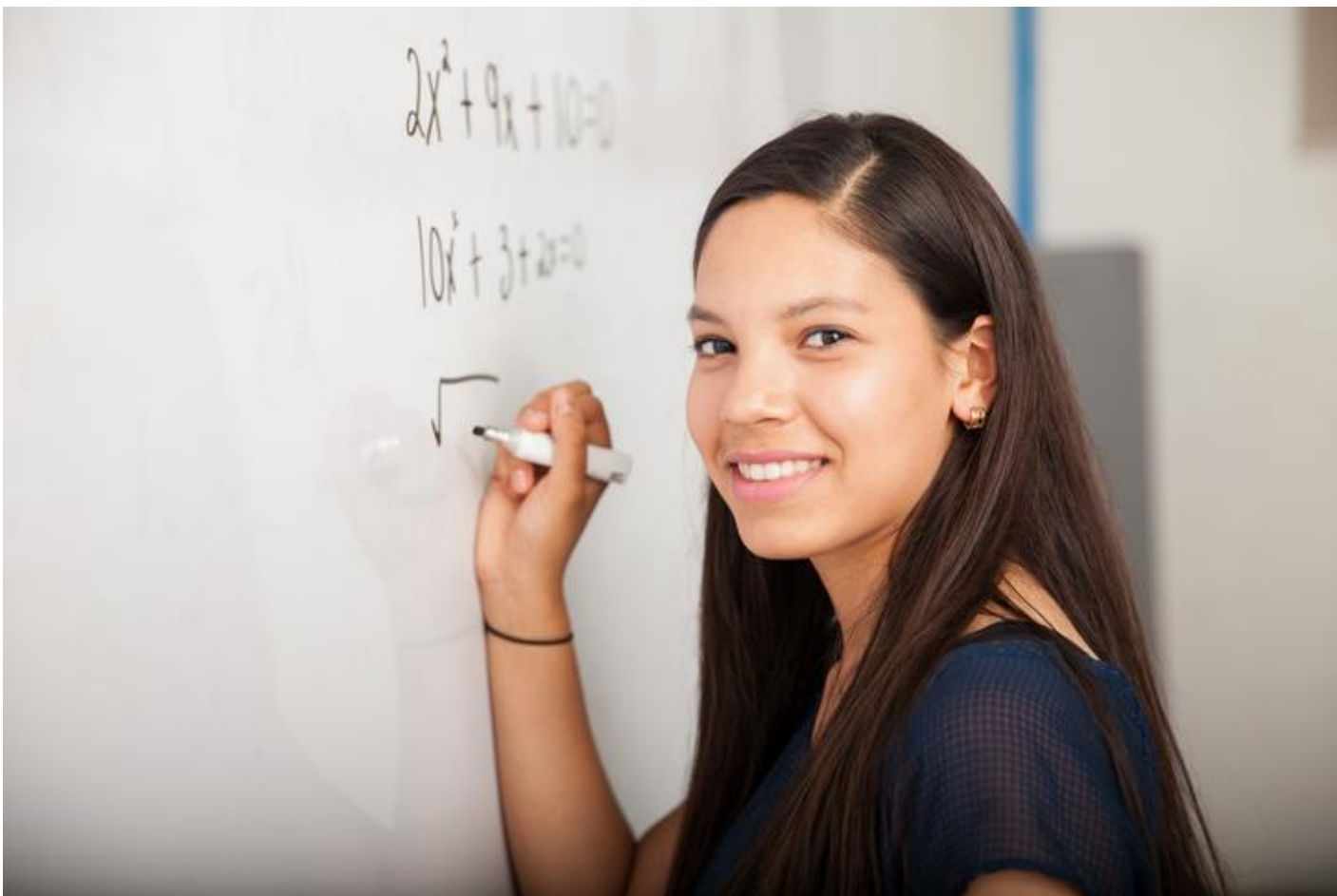
Purpose
This document provides guidance to school districts, educators, and counselors to support mathematics pathways for graduation that meet the passions, aspirations, and postsecondary goals of students. Georgia offers numerous mathematics options that prepare students for life -- earning college credit, enrolling in universities/colleges, or entering straight into the workforce.

Georgia's K-12 Mathematics Standards
On August 26, 2021, the State Board of Education (SBOE) adopted Georgia's K-12 Mathematics Standards. The standards were revised through a citizen-led, student-focused effort first announced in 2019, led by Governor Brian Kemp, State School Superintendent Woods, and the Georgia Department of Education.

The new standards are truly Georgia-developed – they were drafted by Georgia mathematics teachers with input from educational leaders, parents, students, business and industry leaders, and community members. Full implementation of the newly adopted standards began during the 2023-2024 school year.

High School Graduation Requirements
In 2007, the State Board of Education (SBOE) adopted new graduation requirements, effective with the ninth-grade class entering high school in 2008 (SBOE 160-4-2-.48), requiring all students to complete four (4) credits of mathematics to earn a traditional diploma*.

Following the adoption of new K-12 mathematics standards and courses, mathematics requirements for graduation can be met by completing the following courses:
- 1 unit – Algebra: Concepts & Connections (or equivalent)
- 1 unit – Geometry: Concepts & Connections (or equivalent)
- 1 unit – Advanced Algebra: Concepts & Connections (or equivalent)
- 1 unit – Fourth mathematics course (see *Course Options for Fourth Credit in Mathematics*)

Students can meet graduation credits by combining previously earned credits from Georgia Standards of Excellence (GSE) courses with new credits aligned to Georgia's K-12 Mathematics Standards to meet high school graduation requirements.

REQUIRED

Algebra: Concepts & Connections *(or the equivalent)* → Geometry: Concepts & Connections *(or the equivalent)* → Advanced Algebra: Concepts & Connections *(or the equivalent)* → Fourth Core Mathematics Course Option
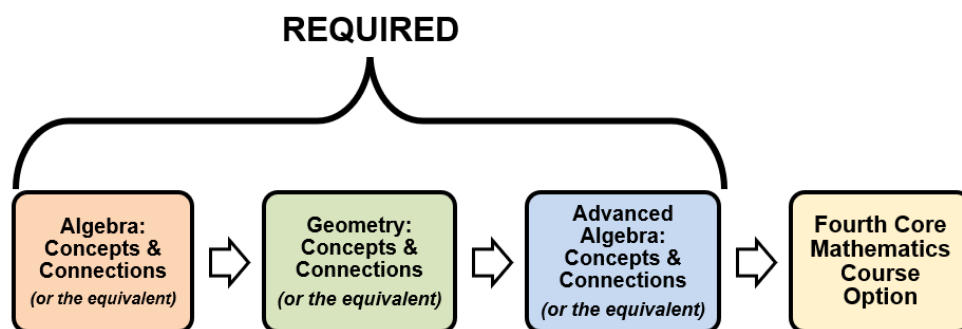
*O.G.G.A. §20-2-149.2 and SBOE Rule 160-4-2-.34 *Dual Enrollment* mandate the completion of two (2) state required units of secondary mathematics, and any associated state required tests, for students pursuing an Accelerated Career Diploma (see *Accelerated Career Diploma*).

Students may take additional units of mathematics over the number of required units for elective credit, especially if pursuing math-heavy or STEM-related fields and degree programs.

Course Options for Mathematics Graduation Requirements for Traditional High School Diploma

Required Course Options for Three Credits in Mathematics

Graduation Requirement	Course Number	Course Name	Federally Required Assessment(s)
1 Required Unit of Core Credit in Mathematics *(two options)*	27.08110	Algebra: Concepts and Connections	Algebra: Concepts & Connections End of Course (EOC)* *SBOE Rule 160-5-1-.15 allows students to demonstrate subject area competency and "test out" of this course.*
	OR		
	27.09110	Enhanced Algebra: Concepts and Connections (taken in Grade 8)	8th Grade End of Grade (EOG) *and* Algebra: Concepts & Connections EOC* *SBOE Rule 160-5-1-.15 allows students to demonstrate subject area competency and "test out" of this course.*

AND

Graduation Requirement	Course Number	Course Name	Federally Required Assessment(s)
1 Required Unit of Core Credit in Mathematics	27.08210	Geometry: Concepts and Connections	None

AND

Graduation Requirement	Course Number	Course Name	Federally Required Assessment(s)
1 Required Unit of Core Credit in Mathematics *(two options)*	27.08310	Advanced Algebra: Concepts and Connections	None
	OR		
	27.09310	Enhanced Advanced Algebra and AP Precalculus: Concepts and Connections	None

Note: The chart above depicts the course sequence conducive to the success of the majority of students. Districts have flexibility to offer courses in the sequence they see fit to increase student outcomes and opportunities. For additional options, see *Mathematics Pathways to Postsecondary* on page 7. Georgia's three (3) required mathematics courses meet eligibility requirements for NCAA.

Course Options for Fourth Credit in Mathematics

The fourth mathematics credit may be satisfied by any 9-12 mathematics course within the *List of State-Funded K-8 Subjects and 9-12 Courses* that is recognized by the University System of Georgia (USG) or the Technical College System of Georgia (TCSG) as supporting the post-secondary success of students.

Whether pursuing higher education across different USG institutions or earning certificates, diplomas, or degrees at TCSG institutions, pathways should not be compared to one another but paired with the goals and aspirations of individual students. It is important for students and families to partner with their counselors to determine the fourth mathematics credit selection that best meets the needs, passions, and post-secondary pursuits of the student.

For students participating in Dual Enrollment by taking college coursework through USG or TCSG, the fourth mathematics credit may be satisfied by any Dual Enrollment mathematics course in the *Georgia Futures Course Directory*. Students must successfully complete the required three (3) mathematics courses before taking additional mathematics courses through dual enrollment.

4th Mathematics Credit Options – State Funded Courses

Course Number	Course Name	Recognized by:
27.04810	Foundations of Algebra *Recommended to be taken prior to Algebra: Concepts & Connections*	TCSG only
27.07200	AP Calculus AB	USG & TCSG
27.07300	AP Calculus BC	USG & TCSG
27.07400	AP Statistics	USG & TCSG
27.07410	AP Precalculus	USG & TCSG
27.07520	Differential Equations	USG & TCSG
27.07700	Multivariable Calculus	USG & TCSG
27.07800	Calculus	USG & TCSG
27.07910	Advanced Finite Mathematics	USG & TCSG
27.08000	Engineering Calculus	USG & TCSG
27.08430	Advanced Financial Algebra	USG & TCSG
27.08500	Advanced Mathematical Decision Making[1]	USG[1] & TCSG
27.08530	Linear Algebra with Computer Science Applications	USG & TCSG
27.08600	Mathematics of Industry and Government[1]	USG[1] & TCSG
27.08630	History of Mathematics	USG & TCSG
27.08800	Statistical Reasoning[1]	USG[1] & TCSG
27.08900	College Readiness Mathematics[1]	USG[1] & TCSG
27.08410	Precalculus	USG & TCSG
27.09000	Technical College Readiness Mathematics[1] **Specific selection criteria may apply.*	TCSG only

[1]The course may not prepare students for admission to the USG institutions with selective admissions (such as the Georgia Institute of Technology and the University of Georgia) and are not appropriate for students planning to enter into a STEM-intensive major.

Note: For additional USG Freshman Admission Requirements, see *Staying on Course: The Required High School Curriculum*.

4th Mathematics Course Options – International Baccalaureate (IB) Courses

Course Number	IDA(3) Course Name	IB Mathematics Course Options
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

Note: International Baccalaureate (IB) courses can be used to satisfy select core mathematics course requirements. Additional information regarding the **International Baccalaureate Program** and their mathematics course options can be found at https://www.ibo.org/programmes/diploma-programme/curriculum/mathematics/.

4th Mathematics Course Credit – Dual Enrollment Options		
Course Number	*Course Name*	*Recognized by:*
MATH 1001	Quantitative Skills and Reasoning	USG & TCSG
MATH 1011	Business Mathematics	TCSG only
MATH 1012	Foundations of Mathematics	TCSG only
MATH 1013	Algebraic Concepts	TCSG only
MATH 1015	Geometry and Trigonometry	TCSG only
MATH 1017	Trigonometry	TCSG only
MATH 1100/1103	Quantitative Skills/Reasoning	USG & TCSG
MATH 1101	Mathematical Modeling	USG & TCSG
MATH 1111	College Algebra	USG & TCSG
MATH 1112	College Trigonometry	USG & TCSG
MATH 1113	Precalculus	USG & TCSG
MATH 1127	Introduction to Statistics	TCSG only
MATH 1131	Calculus I *USG Institutions have different course numbers for this course.*	USG & TCSG
MATH 1132	Calculus II *USG Institutions have different course numbers for this course.*	USG & TCSG
MATH 1133	Calculus III *USG Institutions have different course numbers for this course.*	USG & TCSG
MATH/STAT 1401	Elementary Statistics	USG & TCSG
A full list of approved dual enrollment mathematics core courses can be found on the [GAFutures Course Directory]().		

Note: Student transcripts must accurately reflect courses completed. Transcripts should match the course name and code found in the *GAFutures Dual Enrollment Course Directory*.

In addition to the fourth mathematics credit requirement, students may take additional mathematics coursework for elective credit, especially if pursuing math-heavy or STEM-related fields and degree programs.

For dual enrollment information for Georgia's private colleges, visit the Georgia Independent College Association resource page.

Accelerated Career Diploma

Students wanting to get a head start in pursuit of a career after completing high school have access to the Accelerated Career Diploma as part of the Technical College System of Georgia's *Completion2Career* programs.

Students pursuing the Accelerated Career Diploma must complete two high school mathematics credits as part of the nine required secondary credits, along with either 2 Technical Certificates of Credit (TCCs) or a TCSG Diploma or a TCSG Associate Degree in order to receive their diploma. Mathematics credits must be earned in state required ninth and tenth grade level high school courses or their equivalent, which is satisfied by students completing one of the sequences below:

Accelerated Career Diploma – Mathematics Graduation Requirement Options			
Credit	*Course Sequence*		*Course Sequence*
1	Algebra: Concepts & Connections	**OR**	Foundations of Algebra
2	Geometry: Concepts & Connections		Algebra: Concepts & Connections

Key

	State-required mathematics course per the EOC requirement
	Second mathematics course option; recognized by TCSG

Mathematics Pathways to Postsecondary

Georgia offers a variety of graduation pathways to satisfy state mathematics requirements while meeting the needs and interests of students.

Grade	Enhanced Pathway	Accelerated Pathway	Early Accelerated Pathway	Standard Pathway	Support Pathway	Foundations Pathway	Accelerated Career Diploma
6	Grade 6	Grade 6	Grade 6	Grade 6	Grade 6 with REP or Foundations courses as needed	Grade 6	Grade 6
7	Grade 7	Grade 7	Grade 7	Grade 7	Grade 7 with REP or Foundations courses as needed	Grade 7	Grade 7
8	Enhanced Algebra: Concepts & Connections	Grade 8	Accelerated or Enhanced Algebra: Concepts & Connections	Grade 8	Grade 8 with REP or Foundations courses as needed	Grade 8	Grade 8
9	Geometry: Concepts & Connections	Accelerated Algebra: Concepts & Connections (A) and Geometry: Concepts & Connections (B)	Accelerated or Enhanced Geometry: Concepts & Connections (A) and Advanced Algebra: Concepts & Connections (B)	Algebra: Concepts & Connections (with a support course as needed)	Algebra: Concepts & Connections (with a support course as needed)	Foundations of Algebra	Algebra: Concepts & Connections*
10	Advanced Algebra: Concepts & Connections OR Enhanced Advanced Algebra and AP Precalculus: Concepts & Connections	Accelerated Geometry: Concepts & Connections (A) and Advanced Algebra: Concepts & Connections (B)	Accelerated or Enhanced Advanced Algebra and AP Precalculus: Concepts & Connections AND AP Statistics	Geometry: Concepts & Connections (with a support course as needed)	Geometry: Concepts & Connections (with a support course as needed)	Algebra: Concepts & Connections (with a support course as needed)	Geometry: Concepts & Connections*
11	Precalculus OR AP, IB, & Dual Enrollment Options	Enhanced Advanced Algebra and AP Precalculus: Concepts & Connections OR AP, IB, & Dual Enrollment Options	Fourth Mathematics Course Options, AP, IB, & Dual Enrollment Options (including advanced calculus courses)	Advanced Algebra: Concepts & Connections (with a support course as needed) OR Enhanced Advanced Algebra and AP Precalculus: Concepts & Connections	Advanced Algebra: Concepts & Connections (with a support course as needed)	Geometry: Concepts & Connections (with a support course as needed)	Must complete all additional requirements for an Accelerated Career Diploma. *See Accelerated Career Diploma – Mathematics Graduation Requirement Options
12	Additional Mathematics Course Options, AP, IB, & Dual Enrollment Options	Fourth Mathematics Course Options, AP, IB, & Dual Enrollment Options	Additional Mathematics Course Options, AP, IB, & Dual Enrollment Options (including advanced calculus courses)	Fourth Mathematics Course Options, AP, IB, & Dual Enrollment Options	Fourth Mathematics Course Options, AP, IB, & Dual Enrollment Options	Advanced Algebra: Concepts & Connections (with a support course as needed)	
	Recognized by: USG & TCSG	Recognized by: USG & TCSG	Recognized by: USG & TCSG	Recognized by: USG & TCSG	Recognized by: USG &TCSG	Recognized by: TCSG only	Recognized by: TCSG only

Key

Three core mathematics requirements	Elective mathematics course
Fourth mathematics credit option	

Meeting Students Where They Are

Georgia provides several courses to integrate, support, and accelerate learning. Based on the postsecondary goals and aspirations of students, these courses ensure students have the structures in place to be successful in mathematics.

Integrate	*Support*	*Accelerate*
STEM/STEAM Integration Elementary, Middle and/or High School STEM/STEAM certification.	**Mathematics Co-requisite Support Courses** Students who require additional 'real time' support for success in high school mathematics can be enrolled in co-requisite mathematics support courses for Algebra: Concepts and Connections, Geometry: Concepts and Connections, and/or Advanced Algebra: Concepts and Connections, based on local school district criteria for identifying students who are at risk for failing mathematics. School districts should use prior performance on standardized tests, diagnostic/ formative assessments and classwork as well as input from teachers and parents when making determinations. **Specialized Courses** to support success at TCSG: - Foundations of Algebra - Technical College Readiness Mathematics See *Mathematics Pathways to Postsecondary – Support Pathway and Foundations Pathway* **Remedial Education Program (REP)** If eligibility guidelines are met, the following courses are available: - Grade 6 Connections/Support for Remediation - Grade 7 Connections/Support for Remediation, and - Grade 8 Connections/Support for Remediation. See *Secondary Mathematics Instructional Support for Remedial Education Program*	**Enhanced Coursework** Enhanced Algebra: Concepts & Connections and/or Enhanced Geometry: Concepts & Connections See *Mathematics Pathways to Postsecondary – Enhanced Pathway* **Accelerated A/B Coursework** See *Mathematics Pathways to Postsecondary – Accelerated Pathway & Early Accelerated Pathway* **AP/IB/Gifted Services** **Dual Enrollment** See *4th Mathematics Course Credit -- Dual Enrollment Options* **Calculus, Statistical Reasoning, and Mathematical Modeling Pathways** See *Bridges to Future Success* **Elective Coursework Beyond the 4th Mathematics Requirement** In addition to the fourth mathematics course requirement, students may take additional mathematics coursework for elective credit, especially if pursuing math-heavy or STEM-related fields and degree programs.

Student Transfers

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

Courses with similar names can have significantly varied content; therefore, it is crucial to examine transcripts of students entering Georgia high schools from other states or countries with existing credit in high school mathematics courses. In every case, students' transcripts should be carefully evaluated and compared to Georgia course content. Placement and mathematics proficiency assessments are appropriate as needed. Students' interest and levels of achievement (i.e., 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. State Board of Education Rule 160-5-1-.15 *Awarding Units of Credit and Acceptance of Transfer Credit and/or Grades* provides guidance on how to proceed to grant credit for existing mathematics credits granted by out-of-state schools, nonaccredited schools, home study programs, and non-traditional educational centers.

Section (2)(a) of this rule states that, "Local boards of education shall accept student course credit earned in an accredited school…" and that "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…".

When a higher-level course is transferred in on a student's transcript indicating that the student demonstrates mastery of content beyond the three required mathematics courses, then the student should continue to move forward on 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 work can satisfy that requirement in this instance.

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 code. 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, and CTAE courses. Continuing the student's academic program from the previous school and promoting placement in academically rigorous and career-preparation 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

Mathematics Course Descriptions for all completed high school mathematics courses need to accompany transcripts of students transferring out of a Georgia school.