MISSION

All Baltimore County students will learn rigorous mathematics in an active, engaging environment and will be taught by effective, highly qualified teachers. Instruction will be appropriate for every student and will integrate cutting-edge technology into an application-based mathematical program building the foundation for interested students to step into the world of science, engineering, and applied and pure mathematics. Teachers in mathematics classrooms will create an instructional environment for students to gain an appreciation of mathematics and to understand how mathematics is a viable subject connected to all aspects of everyday life.

Students are required to earn three credits in mathematics. Algebra I, Algebra II, and Geometry meet the University of Maryland System entrance requirements and prepare students for the High School Assessment in mathematics. Gifted and talented and honors sections of courses are advanced courses for the Maryland High School Certificate of Merit. In these classes, the instructional level and materials are modified according to the needs of the students. Course selections will vary according to the academic level and occupational goals of students. Course sequences are shown below.

<table>
<thead>
<tr>
<th>Programs</th>
<th>Grade 9</th>
<th>Grade 10</th>
<th>Grade 11</th>
<th>Grade 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Program</td>
<td>Algebra I</td>
<td>Geometry or</td>
<td>Algebra II or</td>
<td>Trigonometry with Algebra or other Mathematics courses including Advanced</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Algebra II</td>
<td>Geometry</td>
<td>Placement Statistics</td>
</tr>
<tr>
<td>Standard Program Adapted*</td>
<td>Algebra/Data Analysis Adapted</td>
<td>Algebraic Functions Adapted</td>
<td>Geometry</td>
<td>Sets, Functions, and Probability or Algebra II</td>
</tr>
<tr>
<td>Honors Program</td>
<td>Honors Algebra II</td>
<td>Honors Geometry</td>
<td>Honors Trigonometry with Analytic Geometry and/or Honors College Algebra or Honors Precalculus</td>
<td>Honors Trigonometry with Analytic Geometry or Honors College Algebra or Honors Calculus or Advanced Placement Calculus AB and/or Advanced Placement Statistics</td>
</tr>
<tr>
<td>GT Program</td>
<td>GT 9 Geometry</td>
<td>GT 10 Precalculus or Trigonometry with Analytic Geometry and College Algebra</td>
<td>Advanced Placement Calculus AB and/or Advanced Placement Statistics</td>
<td>Advanced Placement Calculus BC and/or Advanced Placement Statistics</td>
</tr>
</tbody>
</table>

*For students recommended through the IEP Team Process or through the ELL Team Process

Algebra I

Course Number: 20.2100.0
Prerequisite: None
Credit: 1
Note: This course is also offered online.

Algebra I provides the foundation for a program in higher mathematics. The course includes simulations, data analysis, linear functions and graphs, systems of linear equations, irrational numbers, operations with polynomials, and exploration of nonlinear equations. Algebra I requires the use of a graphing calculator. (This is a High School Assessment course.)

Mathematics Modeling: Applications to Algebra

Course Number: 20.2150.0
Prerequisite: Completion of Algebra I but did not pass the HSA Credit: ½

This elective course will include and enhance the development of algebraic relationships and skills through hands-on learning experiences with the integration of manipulatives and technology to ensure that students have learned all the concepts and skills required for the successful completion of Algebra, the HSA Algebra/Data Analysis, and are prepared for Algebra II. The course will include enhanced review coverage of algebra concepts and include some Algebra II concepts that apply to real world situations.

Algebra/Data Analysis Adapted

Course Number: 20.2130.0
Prerequisites: This course is intended for grade 9 students recommended through the IEP team process and recommended ELL students attending the BCPS Centers for ELL with appropriate parental approval and final approval from the Office of World Languages.
Credit: 1

This course will focus on the HSA Algebra/Data Analysis Core Learning Goals. Algebra/Data Analysis will include and enhance the development of algebraic relationships and skills through hands-on learning experiences with the integration of manipulatives and technology to ensure that students learn all
the concepts and skills required for the successful completion of algebra and the High School Assessment. The use of a graphing calculator is required. This is an HSA course.

**Algebraic Functions Adapted**  
Course Number: 20.2190.0  
Prerequisites: This course is intended for students recommended through the IEP team process and recommended ELL students attending the BCPS Centers for ELL with appropriate parental approval who completed the Algebra/Data Analysis course.  
Credit: 1

This course provides a more in-depth study of concepts introduced in Algebra/Data Analysis and extends beyond the HSA Algebra/Data Analysis Core Learning Goals to complete an Algebra I program in preparation for Geometry and Algebra II. The use of a graphing calculator is required.

**Sets, Functions, and Probability**  
Course Number: 20.2350.0  
Prerequisites: Successful completion of Algebra I and Geometry is recommended. This course is intended for students recommended through the IEP team process and recommended ELL students attending the BCPS Centers for ELL with appropriate parental approval who completed the Algebra/Data Analysis course.  
Credit: 1

This course involves the study of concepts beyond the Algebra and Geometry courses and assumes that students have taken prerequisite courses. The course presents topics that lead to a future complete study in Algebra II and will develop new concepts necessary for success on the SAT.

**Algebra II**  
Course Number: 20.2200.0  
Course Number: 20.2200.4 (Honors)  
Course Number: 20.2210.5 (Magnet)  
Prerequisites: Successful completion of Algebra I is required.  
Teacher recommendation is required for Honors Algebra II.  
(Students who received a D in Algebra I are encouraged to retake the course in Summer School.)  
Credit: 1  
Note: This course is also offered online.

This course extends algebraic processes and models to matrices, systems of inequalities, linear programming, absolute value functions, quadratic relations and functions, complex numbers, rational equations, exponential functions, and logarithms. Algebra II requires the use of a graphing calculator.

**Geometry**  
Course 20.3000.0  
Course 20.3000.4 (Honors)  
Course 20.0900.5 (GT9)  
Course 20.0900.7 (IB)  
Course 20.3010.5 (Magnet)  
Prerequisites: Successful completion of Algebra I is recommended.  
Teacher recommendation is required for Honors Geometry and GT9 Geometry.  
(Students who received a D in Algebra I are encouraged to retake the course in Summer School.) Only 1 credit in Geometry may be earned.  
Credit: 1  
Note: This course is also offered online.

This course develops the important ideas of Euclidean geometry and the analytic-synthetic method of proof and lays a foundation for subsequent courses in mathematics and science. High school geometry is primarily deductive and employs methods of logical reasoning. Geometry from an algebraic perspective is emphasized throughout.

**ELECTIVE PROGRAMS**

**Trigonometry with Algebra**  
Course Number: 20.2400.0  
Prerequisites: Successful completion of Algebra I, Algebra II, and Geometry is required.  
Credit: 1

This course reviews and extends the concepts from Algebra II to support the study of Trigonometry. Students will use graphing utilities to examine functions and their inverses, trigonometric functions and their graphs, polar coordinates, identities, formulas, and equations, and the solving of right triangles. The course also features preparation for the mathematics portion of the SAT. Trigonometry with Algebra requires the use of a graphing calculator.

**College Readiness Mathematics**  
Course Number: 20.2500.0  
Prerequisites: Successful completion of Algebra I, Algebra II, and Geometry is required.  
Credit: 1

This senior level elective mathematics course uses applications to enhance understanding of advanced algebraic topics like linear models and systems, quadratic and rational functions, exponential and logarithmic functions, and conic sections. The goal is to prepare students to transition from high school to college level mathematics seamlessly.

**Trigonometry with Analytic Geometry (Honors)**  
Course Number: 20.4010.4  
Prerequisites: Successful completion of Algebra II and Geometry and teacher recommendation are required.  
Credit: 1

This course serves as a foundation for students who will be taking calculus. It focuses on right triangle trigonometry, circular functions, graphs of trigonometric functions, inverse trigonometric functions, trigonometric identities, coordinate geometry, oblique triangles, vectors, conic sections, parametric equations, and polar coordinates. This course requires the use of a graphing calculator.

**College Algebra (Honors)**  
Course Number: 20.2800.4  
Prerequisites: Successful completion of Algebra I, Algebra II, and Geometry and teacher recommendation are required.  
Trigonometry/Analytic Geometry should be taken prior to or concurrently with College Algebra.  
Credit: 1

Designed as a college freshman level course for highly able mathematics students, this course focuses on function theory and topics from linear algebra. College Algebra requires the use of a graphing calculator.
**Precalculus (Honors)**  (NT, PR, SP, WST)
Course 20.4900.4
Prerequisites: Successful completion of Algebra I, Algebra II, and Geometry and teacher recommendation are required. Credit: 1

Honors Precalculus is an advanced course for highly able mathematics students. The course combines selected topics from function theory, linear algebra, trigonometry, and analytic geometry in preparation for Calculus I and II. Honors Precalculus requires the use of a graphing calculator.

**Precalculus - Functions and Graphs: GT/IB**
Course 20.1000.5
Prerequisites: Successful completion of GT 8 Algebra II and GT 9 Geometry and teacher recommendation are required. Credit: 1

This course involves the study of function theory in preparation for courses in calculus. Trigonometric functions are treated as a special type of function. Analytic geometry topics are included. The use of a graphing calculator is required.

**Calculus (Honors)**
Course Number: 20.5040.4
Prerequisites: Successful completion of Honors Precalculus or Honors College Algebra and Honors Trigonometry with Analytic Geometry are required. Credit: 1

This course is designed for seniors who desire an introduction to calculus in anticipation of taking calculus as college freshmen. The course presents the theory and techniques of differential and integral calculus with applications but does not maintain the pace or level of rigor appropriate for students planning to take the AP tests. This course requires the use of a graphing calculator.

**AP Calculus AB**
Course Number: 20.5120.6
Credit: 1
Course Number: 20.5130.6
Credit: 1½
Prerequisites: Successful completion of GT 10 Precalculus or Honors Precalculus or Honors College Algebra and Honors Trigonometry/Analytic Geometry and teacher recommendation are required.

Note: This course is also offered online.

This course is designed for students who desire advanced standing in college. It deals with the theory and techniques of differential and integral calculus with applications. Students are provided a structured preparation for the AP exam (AB). Students in the GT program must take this course in grade 11 in order to enroll in GT Mathematics 12: AP Calculus BC. This course is available to seniors in the honors program. The use of a graphing calculator is required.

**AP Calculus BC**
Course 20.5300.6
Prerequisites: Successful completion of AP Calculus AB is required.
Credit: 1
Note: This course is also offered online.

This course is designed to provide students in the gifted and talented mathematics program with a sound background in multivariable calculus. Topics include vector-valued functions, partial derivatives, directional derivatives, multiple integrals, vector fields, line and surface integrals, and Green’s and Stokes' Theorems. Students are provided a structured preparation for the AP exam (BC). Calculus III requires the use of a graphing calculator.

**Statistics (PR, PH, PT, SP)**
Course Number: 20.6000.0
Magnet Course Number: 2060105
Prerequisites: Successful completion of Algebra I, Algebra II, and Geometry is recommended. Credit: ½

This course is designed to acquaint students with the basic techniques of descriptive and inferential statistics. Calculator-assisted applications of statistical topics to business, biology, engineering, industry, and the social sciences will be featured.

**Statistics: GT/AP**
Course Number: 20.6030.6
Magnet Course Number: 20.6010.6
Prerequisites: Successful completion of Honors College Algebra and Honors Trigonometry/Analytic Geometry or Honors Precalculus is recommended. Credit: 1
Note: This course is also offered online.

This calculator-assisted course features the study of techniques in descriptive and inferential statistics and includes frequency and probability distributions, Central Limit Theorem, hypothesis testing and confidence intervals, correlation and regression for bivariate data, analysis of variance, and nonparametric statistics. Students successfully completing this course will be prepared for the AP test in statistics.

**Multivariable Differential Calculus**
Course Number: 20.7000.5
Prerequisites: Successful completion of AP Calculus BC Credit: 1
Note: This course is offered online.

This course is designed to provide students in the gifted and talented mathematics program with a sound background in multivariable differential calculus. Topics include vector-valued functions, partial derivatives, directional derivatives, multiple integrals, vector fields, line and surface integrals, and Green’s and Stokes’ Theorems.

**Linear Algebra**
Course Number: 20.2830.5
Prerequisites: Successful completion of Multivariable Differential Calculus Credit: 1
Note: This course is offered online.

This introductory course is designed to provide students in the gifted and talented mathematics program with a sound background in linear algebra. Topics include matrices, linear equations, vector spaces, bases and coordinates, linear transformations, eigenvectors and eigenvalues, and diagonalization.
Differential Equations
Course Number: 20.2600.5
Prerequisites: Successful completion of Multivariable Differential Calculus
Credit: 1
Note: This course is offered online.

This introductory course is designed to provide students in the gifted and talented mathematics program with a sound background in linear algebra. The course presents basic techniques and methods for solving ordinary differential equations, covering many if not all of the topics found in most first-quarter college courses in differential equations.

ADVANCED PLACEMENT COURSES

Advanced Placement mathematics courses are scheduled whenever they are justified by enrollment. Students enrolled in advanced placement courses are eligible for GT credit. Each advanced placement course includes a study of major mathematical concepts and principles, and includes opportunities that develop problem solving and communication skills.

AP Calculus AB
Course Number: 20.50120.6
Credit: 1
Course Number: 20.5130.6
Credit: 1½

Statistics GT/AP
Course Number: 20.6030.6
Credit: 1

AP Calculus BC
Course Number: 20.5300.6
Credit: 1

INTERNATIONAL BACCALAUREATE (IB)

International Baccalaureate mathematics courses contain a body of knowledge ranging from algebra concepts, statistics, and geometry, to trigonometry and differential calculus which students are required to learn and apply. In their use of mathematical concepts and principles, students develop an ability to recognize patterns and structures, organize and present information, make generalizations, and demonstrate an understanding of and the appropriate use of mathematical modeling. A compulsory project is a course requirement, thus encouraging students to integrate mathematical concepts and principles to analyze and evaluate a unique topic.

Math Studies
Course Number: 20.1910.7
Credit: 1

Math Methods
Course Number: 20.1920.7
Credit: 1

MAGNET COURSES

Modeling/Simulation
Course Number: 20.6100.5
Credit: 1

Finite Math
Course Number: 20.5910.5
Credit: 1