

Mathematics Curriculum

Course Offerings:

Algebra 1 (Gr. 9)	Geometry (Gr. 9 -10)	Honors Geometry (Gr. 9 - 10)
Algebra 2 (Gr. 10 - 11)	Honors Algebra 2 (Gr. 9 - 11)	Pre-Calculus (Gr. 11 - 12)
Honors Pre-Calculus (Gr. 10 - 12)	Financial Algebra (Gr. 11 - 12)	Mathematical Modeling & Reasoning (Gr. 12)
Honors Calculus (Gr. 12)	AP Calculus AB (Gr. 11 - 12)	AP Calculus BC (Gr. 12)
AP Statistics (Gr. 10 - 12)	AP Computer Science Principles (Gr. 10 - 12)	AP Computer Science A (Gr. 11 - 12)

Nordonia High School offers two sequences of Mathematics in grades 9-12. Placement in the various sequences is dependent upon individual abilities, achievement, and career goals. Mathematics is required for all four years; the prerequisite for a grade-level course is the successful completion of the appropriate previous grade-level course. Several elective courses are available to serve as a student's fourth year option for Mathematics.

SUGGESTED COURSE SEQUENCE

GRADE	Advanced College Prep (Math or Related Field)	College Prep Or Career Readiness
Grade 8	Algebra 1	
Grade 9	Honors Geometry	Algebra 1
Grade 10	Honors Algebra 2	Geometry
Grade 11	Honors Pre-Calculus and/or AP Statistics	Algebra 2
Grade 12	Honors Calculus/AP Calculus and/or AP Statistics	Pre-Calculus/AP Statistics Or other Electives

Algebra 1

Course Number: 2105

Credit: 1

Length: year

Grade: 9

This course is designed to formalize and extend the mathematics that students learned in the middle grades. The units in this course will deepen and extend understanding of linear and exponential relationships by contrasting them with each other. Students will apply linear models to data that exhibits a linear trend, analyze the strength of the relationship between the two quantities, and use the model to make predictions. Students will build on their understanding of linear and exponential functions to develop methods for analyzing, solving and using quadratic functions as well as more complex equations.

Geometry

Course Number: 2205

Credit: 1

Length: year

Prerequisite: Credit in Algebra I

Grades: 9 – 10

This course is designed to formalize and extend the student's experience with geometry from the middle grades. Students will deepen their understanding of geometric relationships and demonstrate this understanding through formal mathematical arguments. There is an emphasis on transformational geometry and students will use their understanding of dilations and proportional reasoning to build a formal understanding of similarity. Students will be able to use a coordinate system to verify geometric relationships including relationships between lines, properties of special right triangles and quadrilaterals.

Honors Geometry

Course Number: 2210

Credit: 1

Length: year

Prerequisite: "A" in Algebra I AND teacher recommendation

Grades: 9 – 10

This course is designed to formalize and extend the student's experience with geometry from the middle grades. Students will deepen their understanding of geometric relationships and demonstrate this understanding through formal mathematical arguments and proof. There is an emphasis on transformational geometry and students will use their understanding of dilations and proportional reasoning to build a formal understanding of similarity. Students will develop and apply trigonometric ratios as well as develop equations for non-right triangles. Students will study probability including conditional probability, independence, unions, and intersections. The relationships between angles, arcs, and line segments in a circle will be investigated to develop "circle tools" that can help solve problems involving circles. Students will also study three-dimensional solids and their measurement. This course will prepare students who plan to continue through the high school honors math program.

Algebra 2

Course Number: 2110

Credit: 1

Length: year

Prerequisite: Credit in Algebra I and in Geometry

Grades: 10 – 11

Building on their work with linear, quadratic and exponential functions students will extend their understanding of functions to include polynomial, rational, radical and trigonometric functions. Students will work closely with the expressions that define functions and expand their abilities to model situations and to solve equations and inequalities including solving exponential equations using logarithms.

Honors Algebra 2

Course Number: 2115

Credit: 1

Length: year

Prerequisite: Credit in Algebra I and Geometry and Teacher recommendation

Grades: 9 – 11

Building on their work with linear, quadratic and exponential functions students will extend their understanding of functions to include polynomial, rational, radical and trigonometric functions. Students will work closely with the expressions that define functions and expand their abilities to model situations and to solve equations including solving quadratics over the set of complex numbers and solving exponential equations using logarithms. Students will use data to make inferences and draw conclusions. This course will prepare students who plan to continue through the high school honors math program.

Financial Algebra

Course Number: 2130

Credit: 1

Length: year

Prerequisite: Credit in Algebra II

Grades: 11 – 12

This is a course that uses mathematics to give students the tools to become financially responsible young adults. The course employs algebra, probability and statistics, and geometry to solve financial problems that occur in everyday life. Real-world problems in investing, credit, banking, auto insurance, mortgages, employment, income taxes, budgeting and planning for retirement are solved by applying the relevant mathematics.

Mathematical Modeling and Reasoning

Course Number:

Credit: 1

Length: year

Prerequisite: Credit in Algebra 1 and Geometry and Algebra 2, teacher recommendation.

Grades:12

This course is designed to promote reasoning, problem-solving and modeling through thematic units focused on mathematical practices while reinforcing and extending content in Number and Quantity, Algebra, Functions, Statistics and Probability, and Geometry. Quantitative reasoning and modeling involve the application of mathematics to real-world situations, with careful attention to the choice of units and contextual challenges. Problem-solving requires analyzing an unfamiliar situation and devising a solution strategy. Problem-solving and modeling together provide opportunities for students to experience success with mathematics, not merely improve their self-perception. These habits and skills promote perseverance and cut across disciplines, thus providing a gateway into successful postsecondary education and a variety of careers. *This course would be especially appropriate for students who anticipate attending college and are not intending to pursue a pathway that requires Calculus.*

Pre-Calculus

Course Number: 2400

Credit: 1

Length: year

Prerequisite: Credit in Geometry, “B” or better in Algebra II, teacher recommendation

Grades: 11 – 12

Pre-Calculus includes an advanced study of functions and trigonometry as well as an introduction to discrete math. Students who successfully complete this course will be prepared for Nordonia’s Honor Calculus course. Students must have approval of their Algebra II teacher in order to enroll.

Honors Pre-Calculus

Course Number: 2405

Credit: 1

Length: year

Prerequisite: Credit in Geometry, “B” or better in Honors Algebra II and teacher recommendation

Grades: 11 – 12

This course is intended for students who excelled in Algebra II and have the recommendation of their Algebra II teacher. The course includes an advanced study of functions and trigonometry as well as topics in statistics, probability, and an introduction to discrete math. Students who complete this course will be prepared for AP Calculus.

Honors Calculus

Course Number: 2410

Credit: 1

Length: year

Prerequisite: Credit in Pre-Calculus or Honors Pre-Calculus

Grade: 12

This course is intended for students who would like to develop an understanding of the major topics of calculus, but do not feel ready for the rigor of an AP course. Topics to be discussed are limits, differentiation and applications, and integration. This course will study calculus from a conceptual level and will provide a strong background for students who will need higher math courses in college. The AP Calculus test is not a requirement for this course.

AP Calculus AB

Course Number: 2500

Credit: 1

Length: year

Prerequisite: teacher recommendation and "B" average or better in Pre-Calc or Honors Pre-Calc

Grade: 11-12

AP Calculus AB is designed to be the equivalent of a first semester college calculus course devoted to topics in differential and integral calculus. Topics covered will include the study of limits, derivatives, applications of derivatives, definite and indefinite integrals, applications of integrals, and introductory differential equations. Consistent with AP philosophy, concepts will be expressed and analyzed geometrically, numerically, analytically, and verbally. This college-level Calculus course offers an opportunity to earn college credit while in high school. The course will prepare students for the Advanced Placement Calculus exam (which must be taken as a course requirement). Due to the advanced subject matter, a strong background in algebra and trigonometry is assumed. Pre-Calculus or Honors Pre-Calculus is a prerequisite. Students will be issued a TI-89 calculator for use during the course.

AP Calculus BC

Course Number: 2502

Credit: 1

Length: year

Prerequisite: AP Calculus AB

Grade: 12

AP Calculus BC is a full-year course that gives a complete survey in the calculus of functions of a single variable. AP Calculus BC is designed to be the equivalent to both first and second semester college calculus courses. It includes a thorough review of all topics covered in Calculus AB plus additional units of instruction. AP Calculus BC applies the content and skills learned in AP Calculus AB to parametrically defined curves, polar curves, and vector-valued functions; develops additional integration techniques and applications; and introduces the topics of sequences and series. Students will be required to take the AP Calculus BC Exam as a culmination of the course. All students will be issued a TI-89 calculator for use during the course.

AP Statistics

Course Number: 2610

Credit: 1

Length: year

Prerequisite: "B" or better in Algebra II and Teacher recommendation

Grades: 10 – 12

This college level introductory statistics course introduces students to the major tools for collecting, analyzing and drawing conclusions from data. Students develop analytical and critical thinking skills as they learn to describe data patterns, plan and conduct studies, use probability and simulation to explore random phenomena, estimate population parameters, test hypotheses, and make statistical inferences. May be taken concurrently with a Pre-Calculus or Calculus course. Students will be prepared for, and are required to take the AP Statistics Exam. **A graphing calculator is expected.**

AP Computer Science Principles

Course Number: 2620

Credit: 1

Length: year

Prerequisite: "A" or better in Algebra I and Teacher recommendation

Grades: 10 – 12

The AP Computer Science Principles course is designed to be equivalent to a first semester introductory college computing course for non-computer science majors. This course will introduce students to the creative aspects of programming, abstractions, algorithms, large data sets, the Internet, cybersecurity concerns, and computing impacts. Students will research and explore a computer innovation of their choosing. They will create a visual to summarize the innovation, and describe in writing how the innovation works, how it's used, and the harmful and beneficial effects of the innovation on people and society. Students will be prepared for, and are required to take the AP Computer Science Principles Exam which includes writing an original program along with development documentation.

AP Computer Science A

Course Number: 2630

Credit: 1

Length: year

Prerequisite: Teacher Approval

Grades: 11 – 12

AP Computer Science A introduces students to computer science through programming. Fundamental topics in this course include the design of solutions to problems, the use of data structures to organize large sets of data, the development and implementation of algorithms to process data, and the ethical and social implications of computing systems. The course emphasizes object-oriented programming and design using the Java language. This course is equivalent to a first-semester, college-level course in computer science. It is recommended that a student has a strong foundation of linear functions, composition of functions, and problem-solving strategies that require multiple approaches and collaborative efforts. In addition, students should be able to use a Cartesian (x, y) coordinate system to represent points on a plane. It is important to understand that any significant computer science course builds upon a foundation of mathematical reasoning that should be acquired before attempting such a course.