

Mathematics

COURSE OFFERINGS

<u>Course</u>	<u>Credit</u>	<u>Length</u>	<u>Type of Exam</u>
Algebra I	1 unit	40 weeks	Regents
Algebra IA	1 unit	40 weeks	Local
Algebra IB	1 unit	40 weeks	Regents
Geometry	1 unit	40 weeks	Local
Geometry R	1 unit	40 weeks	Regents
Honors Geometry R	1 unit	40 weeks	Regents
Math Applications	1 unit	40 weeks	Local
Algebra 2 CC	1 unit	40 weeks	CC Regents
Algebra 2A CC	1 unit	40 weeks	Local
Algebra 2B CC	½ unit	20 weeks	CC Regents
Intro to Statistics	½ unit	20 weeks	Local
*Pre-Calculus	1 unit	40 weeks	Local
AP Calculus	1 unit	40 weeks	AP
**NU Statistics	1 unit	40 weeks	Local

*Articulation Agreement with SUNY Erie

**Articulation Agreement with Niagara University

Calculator use: It is strongly suggested that incoming students purchase a TI-84 Plus graphing calculator for use in all Mathematics department courses. Families that already own a TI-83 Plus graphing calculator are welcome to use this, in lieu of purchasing a TI-84. Student use of the graphic calculator is mandatory on all New York State Regents Exam.

Algebra I

Credit: 1 unit Length: 40 weeks

The fundamental purpose of Algebra is to formalize and extend the mathematics that students learned in the middle grades. Due to the fact that this course is built on the middle grades standards, this is a more ambitious version of Algebra than has generally been offered. The critical areas, called clusters, deepen and extend

understanding of linear and exponential relationships by contrasting them with each other and by applying linear models to data that exhibit a linear trend, and students engage in methods for analyzing, solving and using quadratic functions. The Mathematical Practice Standards apply throughout each course and together with the content standards, prescribe that students experience mathematics as a coherent,

useful, and local subject that makes use of their ability to make sense of problem situations.

The critical areas include: Relationships between Quantities and Reasoning with Equations; Linear and Exponential Relationships; Descriptive Statistics; Expressions and Equations; and Quadratic Functions and Modeling. There will be a NYS Regents Examination administered in June. (Use of a graphing calculator, TI-84+, is required.)

Algebra 1A

Credit: 1 unit Length: 40 weeks

Prerequisite: Teacher recommendation

The fundamental purpose of Algebra 1A is to formalize and extend the mathematics that students' learned in the middle grades during the course of their freshman year and then to continue this coursework into their sophomore year (Algebra 1B Next Gen). The critical areas, called clusters, deepen and extend understanding of linear and exponential relationships by contrasting them with each other and by applying linear models to data that exhibit a linear trend, and students engage in methods for analyzing, solving and using quadratic functions. The Mathematical Practice Standards apply throughout each course and together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations. Over a two year period (Algebra 1A & Algebra 1B), the critical areas of learning include: Relationships between Quantities and Reasoning with Equations; Linear and Exponential Relationships; Descriptive Statistics; Expressions and Equations; and

Quadratic Functions and Modeling. There will be a local final examination administered in June. (Use of a graphing calculator, TI-84+, is required.)

Algebra 1B

Credit: 1 unit Length: 40 weeks

Prerequisite: Successful completion of Algebra 1A

The fundamental purpose of Algebra 1B is to formalize and extend the mathematics that students' learned during their freshman year, while enrolled in Algebra 1A. The critical areas, called units, deepen and extend understanding of linear and exponential relationships by contrasting them with each other and by applying linear models to data that exhibit a linear trend, and students engage in methods for analyzing, solving and using quadratic functions. The Mathematical Practice Standards apply throughout each course and together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations. Over a two year period (Algebra 1A & Algebra 1B), the critical areas of learning include: Relationships between Quantities and Reasoning with Equations; Linear and Exponential Relationships; Descriptive Statistics; Expressions and Equations; and Quadratic Functions and Modeling. There will be a NYS Regents Mathematics Examination administered in June. (Use of a graphing calculator, TI-84+, is required.)

Geometry

Credit: 1 unit Length: 40 weeks

Prerequisite: Successful completion of Algebra and Teacher/Counselor Recommendation. Within this course, students will have the opportunity to make conjectures about geometric situations

and prove in a variety of ways, both formal and informal, that their conclusion flows logically from their hypotheses. This course will include, not will not be limited to: transformations, geometric relationships, properties or geometric figures, and congruence and similarity. There will be a local exam administered in June. This sequence does not lead to an Advanced Designation Diploma.

Geometry R

Credit: 1 unit

Length: 40 weeks

Prerequisite: Successful completion of Algebra

The fundamental purpose of Geometry is to formalize and extend students' geometric experiences from previous learning. Students explore more complex geometric situations and deepen their explanations of geometric relationships, moving towards formal mathematical arguments. Important differences exist between this Geometry course and the historical approach taken in Geometry classes. For example, transformations are emphasized early in this course. The Mathematical Practice Standards apply throughout each course and, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and local subject that makes use of their ability to make sense of problem situations. The critical areas include: Congruence, Proofs and Constructions; Similarity, Proof & Trigonometry; Extending to Three Dimensions; Connecting Algebra and Geometry through Coordinates; Circles With and Without Coordinates. There will be a NYS Regents Examination administered in June. (Use of a graphing calculator, TI-84+, is required.)

Honors Geometry R

Credit: 1 unit

Length: 40 weeks

Prerequisite: Successful completion of Algebra 1 in 8th grade/Enriched Algebra 1 or teacher recommendation

The fundamental purpose of Honors Geometry is to formalize and extend students' geometric experiences from previous learning. Students explore more complex geometric situations and deepen their explanations of geometric relationships, moving towards formal mathematical arguments. Important differences exist between this Geometry course and the historical approach taken in Geometry classes. For example, transformations are emphasized early in this course. Close attention should be paid to the introductory content for the Geometry conceptual category found in the high school State Standards. The Mathematical Practice Standards apply throughout each course and, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and local subject that makes use of their ability to make sense of problem situations. The critical areas include: Congruence, Proofs and Constructions; Similarity, Proof & Trigonometry; Extending to Three Dimensions; Connecting Algebra and Geometry through Coordinates; Circles With and Without Coordinates. There will be a NYS Regents Examination administered in June. (Use of a graphing calculator, TI-84+, is required.)

Math Applications

Credit: 1 unit

Length: 40 weeks

Prerequisite: Successful completion of Geometry R or Geometry

Math applications is designed for students to meet their third credit requirement at the commencement level. This course will provide a variety of everyday problem

solving situations. Students will learn the necessary mathematical skills needed to solve the presented mathematics courses. Math applications will prepare students for college achievement tests (i.e. A.C.T. and /or S.A.T.) and college entrance/placement tests (i.e. AccuPlacer). In addition, this course will provide students the option to continue on to Algebra 2A. This course will have a local exam administered in June.

Algebra 2A CC

Credit: 1 unit Length: 40 weeks
Prerequisite: Successful completion of Geometry R, Math Applications or Teacher Recommendation
Algebra 2A is a continuation and extension of Algebra and Geometry, and is the first of a year and a half course sequence leading to the Mathematics requirement for a "Regents Diploma with Advanced Designation". While developing the algebraic techniques that will be required of those students that continue their study of mathematics, this course is also intended to continue developing alternative solution strategies and algorithms. For example, technology can provide to many students the means to address a problem situation to which they might not otherwise have access. Within this course, the number system will be extended to include imaginary and complex numbers. The families of functions to be studied will include polynomial, absolute value, radical, exponential, and logarithmic functions. Problems resulting in systems of equations will be solved graphically and algebraically. Algebraic techniques will be developed to facilitate rewriting mathematical expressions into multiple equivalent forms. This course will have a local exam administered in June.

Algebra 2B CC

Credit: $\frac{1}{2}$ unit Length: 20 weeks
Prerequisite: Successful completion of Algebra 2A CC
Algebra 2B is a continuation and extension of the Algebra 2A course that preceded it and the capstone of a sequence towards a "Regents Diploma with Advanced Designation". Arithmetic and geometric sequences will be expressed in multiple forms, and arithmetic and geometric series will be evaluated. The families of functions to be studied will include trigonometric functions of sine, cosine, tangent, secant and cosecant. Binomial experiments will provide the basis for the study of probability theory, and the normal probability distribution will be analyzed and used as an approximation for these binomial experiments. Right triangle trigonometry will be expanded to include the infestation of circular functions. Data analysis will be extended to include measures of dispersion and the analysis of regression that model functions studies throughout this course. Associated correlation coefficients will be determined, using technology tools and interpreted as a measure of strength of the relationship. Problem situations requiring the use of trigonometric equations and identities will also be investigated. There will be a NYS Common Core Regents Examination administered in January. (Use of a graphing calculator, TI-84+, is required.)

Algebra 2 CC

Credit: 1 unit Length: 40 weeks
Prerequisite: Successful completion of Geometry R
Algebra 2 CC is the capstone course for the examination required for a "Regents Diploma with Advanced Designation". This course is a continuation and extension of the two courses that precede it. While developing the algebraic techniques that will be required of those students that continue

their study of mathematics, this course is also intended to continue developing alternative solution strategies and algorithms. For example, technology can provide to many students the means to address a problem situation to which they might not otherwise have access. Within this course, the number system will be extended to include imaginary and complex numbers. The families of functions to be studied will include polynomial, absolute value, radical, trigonometric, exponential and logarithmic functions. Problem situations involving direct and indirect variation will be solved. Problems resulting in systems of equations will be solved graphically and algebraically. Algebraic techniques will be developed to facilitate rewriting mathematical expressions into multiple equivalent forms. Data analysis will be extended to include measures of dispersion and the analysis of regression that model functions studied throughout this course. Associated correlations coefficients will be determined, using technology tools and interpreted as a measure of strength of the relationship. Arithmetic and geometric sequences will be expressed in multiple forms, and arithmetic and geometric series will be evaluated. Binomial experiments will provide the basis for the study of probability theory and the normal probability distribution will be analyzed and used as an approximation for these binomial experiments. Right triangle trigonometry will be expanded to include the investigation of circular functions. Problem situations requiring the use of trigonometric equations and identities will also be investigated. There will be a NYS Common Core Regents Examination administered in June. (Use of a graphing calculator, TI-84+, is required.)

Precalculus

Credit: 1 unit

Length: 40 weeks

Prerequisite: Successful completion of Algebra 2 CC

Precalculus is designed to provide students the foundation needed to be successful in college level Calculus. Topics include higher order polynomial equations, determinants, matrices, linear programming; exponential and logarithmic functions; probability and statistics; sequences and series, trigonometric identities, and partial fractions. Rational functions are examined with the goal to be able to find limits and examine for discontinuance. Analytic Geometry will be explored with the emphasis on the measurements of distance, angles and area as well as 3-dimension. Throughout the course, emphasis will be put on developing problem solving skills. Students are encouraged to have a graphing calculator. There will be a local examination administered in June.

Articulation Agreement with SUNY Erie for course MT-180 Precalculus Mathematics. 4 credit course for a cost of approximately \$360.00.

Intro to Statistics

Credit: ½ unit

Length: 20 weeks

Prerequisite: Successful completion of 2 or more years of high school math and teacher recommendation

Intro to Statistics is designed for students who successfully passed two years of high school math and wish to increase their understanding of data collection and analysis in applied settings. Much of the course will be devoted to project based learning activities that incorporate the fundamentals of statistics, This is an excellent course for students wanting to take Statistics but may not be ready for the rigor of a full year of College Stats. Topics will include regression, measures of central tendency, correlation, explaining and

interpreting statistical analysis, planning and implementing experiments, anticipating patterns and interpreting real world data.

AP Calculus

Credit: 1 unit

Length: 40 weeks

Prerequisite: Successful completion of Pre-calculus or Teacher recommendation.

AP Calculus is designed to give students an opportunity to take a college level Calculus class. It is necessary for students in this course to bring a TI-84 Plus graphing calculator or a TI-89 calculator to class each day. Students are required to sit for an AP examination in May of their senior year. A score of 3, 4, or 5 will possibly allow the student to receive college credit for this course. This is a first year college level course with an emphasis on the derivative and the integral and their applications.

Students will be required to sit for the AP exam in May. The AP exam fee is covered by the district.

NU Statistics

Credit: 1 Unit

Length: 40 Weeks

Prerequisite: successful completion of Algebra 2 CC, Teacher recommendation and an overall cumulative average of 80% or higher.

The purpose of this course is to introduce students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Students are exposed to four broad conceptual themes: 1) Exploratory Analysis 2) Studies and Experiments 3) Probability 4) Statistical Inference. It is necessary for students to bring their own TI-83+ or TI-84+ (preferred) graphing calculator. There will be a local examination administered at the end of the course.

Articulation Agreement with Niagara University for course MAT-102 Statistics. The cost of the course is approximately \$285. Students that are eligible for

free and reduced lunch can receive financial assistance and a reduced rate of \$45 through Niagara University.

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