

Niagara Falls High School

Math Course Descriptions

Graphing Calculators, such as the Ti-83 plus, Ti-84 plus and Ti-84C Silver are used in all High School Math courses. While the NFCSD will provide calculators during tests and exams, it is highly recommended that students purchase their own to become familiar with its functionality and have access to the device for homework and practice.

ALGEBRA I

MAT130 – 1.0 credit

The fundamental purpose of this course which is aligned with the content standards associated with the NYS Algebra I Common Core (CC) Learning Standards for Mathematics is to formalize and extend the mathematics that students learned in the middle school grades. The content standards define what students should understand and be able to do at the high school level; the Model Content Framework describes which content is included and emphasized within the Algebra 1 course, specifically.

For high school mathematics, the standards are organized at three levels: conceptual categories, domains, and clusters. Common Core Algebra 1 is organized within four conceptual categories: Number & Quantity, Algebra, Functions, and Statistics & Probability.

Each conceptual category contains domains of related clusters of standards. The lessons deepen and extend understanding of functions and students engage in methods for analyzing, solving, and using these functions in real world situations. The Mathematical Practice Standards apply throughout the 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. A class period of instruction consists of 40 minutes each day, five days a week for a length of 40 weeks.

Final Assessment: Students will take the NYS Algebra I Common Core Regents Exam at the end of the year. A grade of 65 or higher on the NYS Common Core Regents Exams is a requirement for High School graduation in NYS.

GEOMETRY

MAT230 – 1.0 credit

This course is intended to be the first course in mathematics for high school students. In this course, students will have the opportunity to make conjectures about geometric situations and prove, in a variety of ways, both formally and informally, that their conclusion follows logically from their hypothesis. This course is meant to employ an integrated approach to the study of geometric relationships. Integrating synthetic, transformational, and coordinate approaches to geometry, students will justify geometric relationships and properties of geometric figures.

Exam: Students are required to take a NYS Regents exam in Geometry. Successful completion of this exam is part of the requirement for a Regents with Distinction Diploma in NYS.

PREREQUISITE: Successful completion of the NYS Algebra 1 course including Regents exam.

STEM: CODING & ENGINEERING

MAT236 – 1.0 credit

The STEM Coding and Engineering course is currently being offered to 10th graders who are interested in coding languages. We will utilize a project-based approach and engineering design to engage student in learning. The job market for coding and engineering related jobs has increased exponentially over the years and we need students with diverse backgrounds to consider entering the STEM job fields. Some of the topics we will focus on in this class are website design, HTML coding, cyber security, video game design and JavaScript coding, app development, Micro:bit computer chip programming, python coding, animation, 3-D Printing, robotics, LEGO Mindstorms, EV3 robots and more. Students will be challenged in a rigorous STEM curriculum which will aid them in learning about STEM topics and consider entering STEM careers.

PREREQUISITE: Successful completion of the course and Regents exam in Algebra 1

ACCELERATED GEOMETRY

MAT240 – 1.0 credit

This course is intended to be the first course in mathematics for high school freshmen already accepted in the NFCSD Accelerated Program. Students are expected to have taken and passed the Algebra 1 course including the Common Core Algebra 1 Regents Exam in Preparatory School. In this course, students will have the opportunity to make conjectures about geometric situations and prove, in a variety of ways, both formally and informally, that their conclusion follows logically from their hypothesis. This accelerated course is meant to employ an integrated approach to the study of geometric relationships. Integrating synthetic, transformational, and coordinate approaches to geometry, students will justify geometric relationships and properties of geometric figures.

Exam: Students are required to take a NYS Regents exam in Geometry. Successful completion of this exam is part of the requirement for a Regents with Distinction Diploma in NYS.

PREREQUISITE: Successful completion of the NYS Algebra 1 course including Regents exam.

MATH FOR BUILDING & DESIGN

MAT320 – 1.0 credit

This “NEW” course is designed for the creative, hands on learner. It will focus on the study of mathematics used in real world. Building and design includes the study of architecture and building and those jobs associated with it. For example, carpenter, electrician, painter, carpet layer, plumbers, landscapers, graphic design, etc. The course will include project-based learning, guest speakers, and the necessary mathematics.

PREREQUISITE: Successful completion of the course and Regents exam in Algebra 1

ALGEBRA II (NON-REGENTS)

MAT321 – 1.0 credit

Non-Regents Algebra II/ Trigonometry is a high school credit bearing course intended focus on the essential skills from the Regents curriculum. Students can earn their third or fourth credits in mathematics by successfully completing the course. The course will focus on Advanced Algebra and trigonometry concepts but will also introduce some statistics and probability content. Non-Regents Algebra II/Trig contains Content and Process strands such as: Number Sense and Operation, Algebra, Geometry, Measurement, and Statistics and Probability, Problem Solving, Reasoning and Proof, Communication, Connection and Representation.

Exam: Students are required to take the NFCSD final exam. Successful completion of this course earns 1.0 math credits.

ALGEBRA II

MAT330 – 1.0 credit

Algebra II Common Core is a credit bearing Regents course offered in the New York State Sequence. Students can earn their third or fourth credits in mathematics by successfully completing the course. The fundamental purpose of this course is to build upon knowledge of linear, quadratic and exponential functions. Students extend their repertoire of functions to include polynomial, rational and radical functions. Students work with expressions that define the functions and continue to expand and hone their abilities to model situations and solve the equations. These include solving quadratic equations over the set of complex numbers and solving exponential equations using the properties of logarithms. Students will also make inferences and conclusions from data and see how the visual displays and summary statistics they learned in earlier grades relate to different types of data like probability and distributions. The NYS Mathematical Practice Standards will be applied throughout the course and, together with the NYS Content Standards, students will experience mathematics as a coherent, useful and logical subject that makes use of their ability to make sense of real world situations. A class period of instruction consists of 40 minutes each day, five days a week for a length of 40 weeks.

Final Assessment: Students are required to take the NYS Regents Common Core Exam in Algebra II. Successful completion of this exam is part of the requirement for an Advanced Regents Diploma in NYS.

PREREQUISITE: Successful completion of both the course and Regents exam in Algebra 1 and Geometry are required.

ALGEBRA II AC
MAT340 – 1.0 credit

Accelerated Algebra II Common Core is credit bearing Regents course offered in the New York State Sequence and is intended for students already accepted in the NFCS D Accelerated Program. Students can earn their third or fourth credits in mathematics by successfully completing the course. The fundamental purpose of this advanced course is to build upon knowledge of linear, quadratic and exponential functions. Students extend their repertoire of functions to include polynomial, rational and radical functions. Students work with expressions that define the functions and continue to expand and hone their abilities to model situations and solve the equations. These include solving quadratic equations over the set of complex numbers and solving exponential equations using the properties of logarithms. Students will also make inferences and conclusions from data and see how the visual displays and summary statistics they learned in earlier grades relate to different types of data like probability and distributions. The NYS Mathematical Practice Standards will be applied throughout the course and, together with the NYS Content Standards, students will experience mathematics as a coherent, useful and logical subject that makes use of their ability to make sense of real world situations. A class period of instruction consists of 40 minutes each day, five days a week for a length of 40 weeks.

Final Assessment: Students are required to take the NYS Regents Common Core Exam in Algebra II. Successful completion of this exam is part of the requirement to earn an Advanced Regents Diploma in NYS.

PREREQUISITE: Successful completion of both the course and Regents exam in Algebra 1 and Geometry are required.

APPLIED MATH
MAT420 – 1.0 credit

Don't know what to do after High School? Why not earn a math credit while deciding in this "NEW" math course! The course will include practice for the purpose of passing the required math exams for college, or a math competency test to be hired for some job. Perhaps, you need to learn survival skills, for example rent, credit, bills, car, food and etc. Whatever the situation, by making the commitment to practice your math skills, you are promising yourself increased success and marketability. Course will include guest speakers, minor projects, necessary mathematics.

PREREQUISITE: Successful completion of the course and Regents exam in Algebra 1

PRE-CALCULUS
MAT430 – 1.0 credit

This course includes a study of angles and their trigonometric functions, trigonometry of right triangles, applications and graphs of trigonometric functions, coordinate geometry, functions and their graphs, conic sections, exponents, rational expressions, interval notation and an introduction to limits. It includes the use of the graphing calculator in the development of the topics of pre-calculus and differential calculus. District honors eligibility is required. College credit may be obtained through NCCC upon successful completion of this course.

Exam: These students will be required to take a NFCS D final exam.

PRE-CALCULUS ACCELERATED
MAT440 – 1.0 credit

This course is designed for the accelerated student and includes such topics as linear functions, theory of polynomials, sequences and series, matrices, analytical geometry, relations and functions, limits, differentiation and integration. Students will learn to solve problems through the use of graphing calculators and be required to graph functions and solve problems without the use of technological devices. Students may sign up for 4 hours of college credit through NCCC.

Exam: These students will be required to take a NFCS D final exam.

INTRODUCTION TO STATISTICS

MAT530 – 1.0 CREDIT

This course includes a study of the basic terminology and methods of elementary statistics including organization of data, measures of central tendency and dispersion, sampling theory, estimation and testing of hypotheses. This course also includes an introduction to correlation and linear regression. Three credit hours are available from Niagara University. To qualify for college credit, students must pass a final exam that is approved by Niagara University. A class period of instruction consists of 40 minutes each day, five days a week for a length of 40 weeks.

Final Assessment: Students will be required to take a final exam approved by Niagara University..

CALCULUS

MAT540 – 1.0 credit

The course teaches all topics associated with functions, graphs, and limits; derivatives; and integrals as delineated in the Calculus Topic Outline in the Course Description Guide. Student conceptual development of topics builds on numerical, graphical, analytical and verbal connections. The first half of this course includes differentiated and integral calculus. The material is similar to a first semester college calculus course. Four credit hours are available from NCCC. Pre-calculus is a prerequisite for the course.

Exam: These students will be required to take a NFCS D final exam.

AP CALCULUS A/B

MAT550 – 2.0 credits

The first half of this course includes differentiated and integral calculus. Students enrolled in the course must have taken and passed Accelerated Pre-calculus. The material is similar to a first semester college calculus course. Four credit hours are available from Niagara University. To qualify for college credit, students must take a midterm and final from Niagara University.

The second half of this course is similar to a second semester Calculus 2 college course. Four credit hours are available from Niagara University. To qualify for college credit, students must take a midterm and final from Niagara University. District honors eligibility is required. This course will also prepare students to take the required Calculus AB exam.

Exam: Students will be taking both the College Board AP Calculus exam along with a NFCS D final exam approved by Niagara University.

STEM: APPLIED MATH/SCIENCE INNOVATIONS

MAT336 – 2.0 Credits (1 credit – Science; 1 credit – Math)

The STEM classroom entitled Applied Innovations offers a rich exposure to computer design, product based engineering, computer coding and robotics. STEM (Science Technology Engineering and Mathematics) careers are the most rapidly growing fields in today's work force. Students will have an opportunity to work with 3D Scanners and Printers, CNC Routers, and Laser Cutters to create both physical and virtual manipulatives while studying pre-engineering topics. The focus of the class will be project-based inquiry learning which develops a student's ability to adapt to modern day work force skills.

We are a project based classroom. Each unit of study explores current advancements in STEM related fields while focusing on a different area of Science. Applied mathematical concepts will be needed in every aspect of the course as well. Students must be comfortable with working independently and in groups to complete in-class activities and projects, including quarterly portfolio assessments.

Upon enrollment and successful completion of this course, students can earn 3 total transferable DRF275 –

Advanced Computer Aided Design & Drafting credits from NCCC.

PREREQUISITE: Successful completion of the NYS Living Environment Regents Exam, NYS Integrated Algebra/Common Core Algebra I Exam and the NYS Global Exam.

STEM: BioStatistics

SCI336 – 2.0 Credits (1 credit – Science; 1 credit – Math)

This is a unique course that blends biology and statistics using real world issues and applications. Science, technology, engineering, and mathematics are explored through project-based learning, experimentation, and various methods of data collection and review. This course takes place in one of the state-of-the art STEM classrooms that includes technology such as gel-electrophoresis equipment, digital microscopes, and micro-bits, which allows for a true hands-on experience. Some of the biology topics explored include infectious diseases, genetic disorders, genomics, and concussion and addiction research. Data related to these topics is gathered and analyzed using Microsoft excel and students will become familiar with displaying and describing data, regression, statistical inference, the normal curve, hypothesis testing, confidence intervals, and more.

Upon enrollment and successful completion of this course, students can earn 6 total transferable credits: 3-MAT 102 and 3 – BIO101 from Niagara University.

PREREQUISITE: Successful completion of the NYS Living Environment Regents Exam, NYS Integrated Algebra/Common Core Algebra I Exam and the NYS Global Exam.