

Mathematics

Course Name: **Introduction to Algebra**

Credit: **1**

This course focuses on basic algebra skills. Topics will include numeration, operations of monomials and polynomials, solving equations, and the real number system. Students will take a department exam in June. Upon successful completion of this course, students will enroll in Algebra 1R.

Course Name: **Algebra 1R**

Credit: **1**

The principle strand of this course is algebra and its applications. Topics include solving first and second-degree equations and their applications, systems of equations, the real number system, probability, statistics, and operations on polynomials. Students who successfully complete this course will enroll in Geometry or Geometry R.

Course Name: **Algebra 1R Lab**

Credit: **0**

This lab is designed to provide students with extra time to ensure that they understand concepts taught in their Algebra 1R class. The topics covered will coincide with those being taught in the Algebra 1R class and will also have a strong focus on functions of the graphing calculator. The topics include number sense, solving quadratic and linear equations, factoring, statistics, probability, as well as many other exciting concepts. The class will meet on alternating days.

Course Name: **Geometry H**

Credit: **1**

Prerequisite: **Final average of 85 or higher in Math 8H or approval based upon completion of Honors Matrix**

This is a challenging honors level geometry course. Topics include Euclidean and coordinate geometry, similarity, right triangle relationships, geometry of quadrilaterals, transformations, locus, geometry of the circle, and conic sections. A departmental examination will be given in June. Students who successfully complete this course with a final average of 85 or higher will enroll in Algebra 2 and Trigonometry H; others will enroll in Algebra 2 and Trigonometry R.

Course Name: **Geometry**
Credit: **1**
Prerequisite: **Completion of Algebra 1R**

This class involves the use of manipulatives, cooperative learning, and other alternative instructional techniques. The principle strand of this course is geometry and its applications. Topics include Euclidean and coordinate geometry, similarity, right triangle relationships, geometry of quadrilaterals, transformations, locus, and geometry of the circle. Students take a local final exam at the end of this course.

Course Name: **Geometry R**
Credit: **1**
Prerequisite: **Completion of Algebra 1R**

The principle strand of this course is geometry and its applications. Topics include Euclidean and coordinate geometry, similarity, right triangle relationships, geometry of quadrilaterals, transformations, locus, and geometry of the circle. Students will take the Geometry Regents at the end of this course.

Course Name: **Algebra 2 and Trigonometry H**
Credit: **1**
Prerequisite: **Final average of 85 or higher in Geometry H or approval based upon completion of Honors Matrix**

This challenging honors level mathematics course focuses on advanced algebra and its applications. Topics include operations on polynomials, exponential, logarithmic, and trigonometric functions, probability and statistics, and an introduction to calculus. Mathematical modeling is then used to apply these topics to real life experiences. The Mathematics B Examination will be given in June.

Course Name: **Intermediate Algebra**
Credit: **1**
Prerequisite: **Completion of Geometry**

The principle strand of this course is intermediate algebra and its applications. Topics include operations on polynomials, exponential and logarithmic functions, and probability and statistics. An emphasis is placed upon the use of these functions in real life situations. A departmental examination will be given in June.

Course Name: Algebra 2 and Trigonometry R
Credit: 1
Prerequisite: Completion of Geometry R with an average of 70 or higher or completion of Intermediate Algebra

The principle strand of this course is advanced algebra and its applications. Topics include operations on polynomials, exponential, logarithmic, and trigonometric functions, probability and statistics, and conic sections. Mathematical modeling is then used to apply these topics to real life experiences. Students will take the Mathematics B Regents Exam in June.

Course Name: Calculus 1
Credit: 1
Prerequisite: Final average of 85 or higher in Algebra 2 and Trigonometry H or approval based upon completion of Honors Matrix

Calculus 1 is a college level mathematics course typical of most traditional first-year calculus courses. The concepts of limit, continuity, derivative, and anti-derivative are developed and then applied to the traditional collection of functions: polynomial, rational, trigonometric, and exponential, together with their inverses, compositions, and algebraic combinations. The results are then applied to a variety of problems from geometry, physics, and other sciences. These include maximum and minimum problems, related rates, areas, volumes and surfaces of revolution, arc length, work, fluid pressure, velocity and acceleration, and exponential growth and decay.

Students in this course will either pay for the AP Examination in May or pay tuition to Syracuse University and enroll as a student in the Syracuse University Project Advance (SUPA) program. Students writing the AP examination may earn 4 undergraduate credit hours, depending on the score on the exam. Upon successful completion of SUPA Calculus, students will receive 4 undergraduate credit hours. The 2007-2008 tuition rates for SUPA courses were \$110.00 per credit hour.

Course Name: Advanced Algebra
Credit: 1
Prerequisite: Completion of Intermediate Algebra or Algebra 2 and Trigonometry

This course continues the integration of algebra into higher-level mathematics. Topics include polynomial, exponential, logarithmic, and trigonometric functions. An emphasis is placed on the use of these functions in real life situations. A departmental examination will be given in June, and students may challenge the Mathematics B Examination in June.

Course Name: **Statistics**
Credit: **1**
Prerequisite: **Successful completion of the Mathematics A or Algebra Examination and three credits of high school mathematics**

Statistics is a college level introductory statistics course. Students will learn how to collect, analyze, interpret, and draw conclusions from data. The topics presented include exploring data describing patterns and departure from patterns, sampling and experimentation, exploring random phenomena using probability and simulation, and estimating population parameters and testing hypotheses. Students who successfully complete this course will receive 3 credits from Dutchess Community College.

Course Name: **Precalculus R**
Credit: **1**
Prerequisite: **Completion of Algebra 2 and Trigonometry R and passing the Math B Regents**

This course continues the integration of topics studied in earlier math courses. Topics include polynomial, rational, exponential, logarithmic, trigonometric, polar, and parametric functions, matrices, sequences and series, probability and statistics, and conic sections. Mathematical modeling is then used to apply these topics to real life experiences. A departmental examination will be given in June. Students who successfully complete this course will receive 3 credits from Dutchess Community College.

Course Name: **Calculus 2: Syracuse University Math 296**
Credit: **1**
Prerequisite: **Completion of Calculus 1 with an average of 85 or higher**

Calculus 2 is a college level mathematics course designed by Syracuse University Project Advance (SUPA). The mathematical content of this course is typical of most traditional second-year calculus courses. The exponential, logarithm, and inverse trigonometric functions are defined and their calculus developed. Topics covered include separable and linear differential equations, L'Hopital's Rule and limits of indeterminate forms with applications to improper integrals, and various techniques of integration, including integration by parts, by partial fractions, and by trigonometric substitution. There will also be a brief introduction to calculus in polar coordinates and of parametric curves, infinite sequences, convergence and divergence, infinite series, ratio test, root test, comparison test, integral test, alternating series test, Power series, radius of convergence, and Taylor and Maclaurian series. Students in this course will pay tuition to Syracuse University and upon successful completion of the course will receive 4 undergraduate credit hours. The 2007-2008 tuition rates for SUPA courses were \$110.00 per credit hour.

Course Name: Mathematics for Personal Finance
Credit: 1/2
Prerequisite: Two credits of high school mathematics and successful completion of the Mathematics A or Algebra Examination

This course is designed to prepare students for both a college level business program and to better understand the complex financial world they will encounter during their lives. Topics to be studied include payroll, tax preparation, interest, budgeting, loans and mortgages, annuities, and various forms of investments such as stocks. A departmental final exam will be given at the end of the course.

Course Name: Principles of Engineering
Credit: 1
Prerequisite: Two credits of high school mathematics and successful completion of the Mathematics A or Algebra Examination

Principles of Engineering is a hands-on course demonstrating how different forms of engineering exists in our world. Themes covered in this course include but are not limited to energy, robotics, structures and shelters, and motion and flight. Assessments will be through projects, presentations, reports, and competitions. Working cooperatively with different people is a must.

Course Name: Number Theory and Discrete Mathematics
Credit: 1/2
Prerequisite: Two credits of high school mathematics and successful completion of the Mathematics A or Algebra Examination.

This course involves number theory, geometry, intermediate algebraic concepts, applied statistics (based on real life data analyses), and probability. The focus of the course is on problem solving strategies using many of the aforementioned topics and their relationship to real-life mathematics and standardized tests. A departmental examination will be given at the end of the course.