Algebra
Advanced Algebra w/ Trigonometry
Calculus AB AP
Calculus BC AP
Computer Science A AP
Finite Math
Fundamentals of Geometry
Geometry
Geometry/Trigonometry
Intermediate Algebra
Seminar I - Math
Pre-Calculus
Statistics AP
Trig/Pre-Calculus
Career Internship Program

Mathematics

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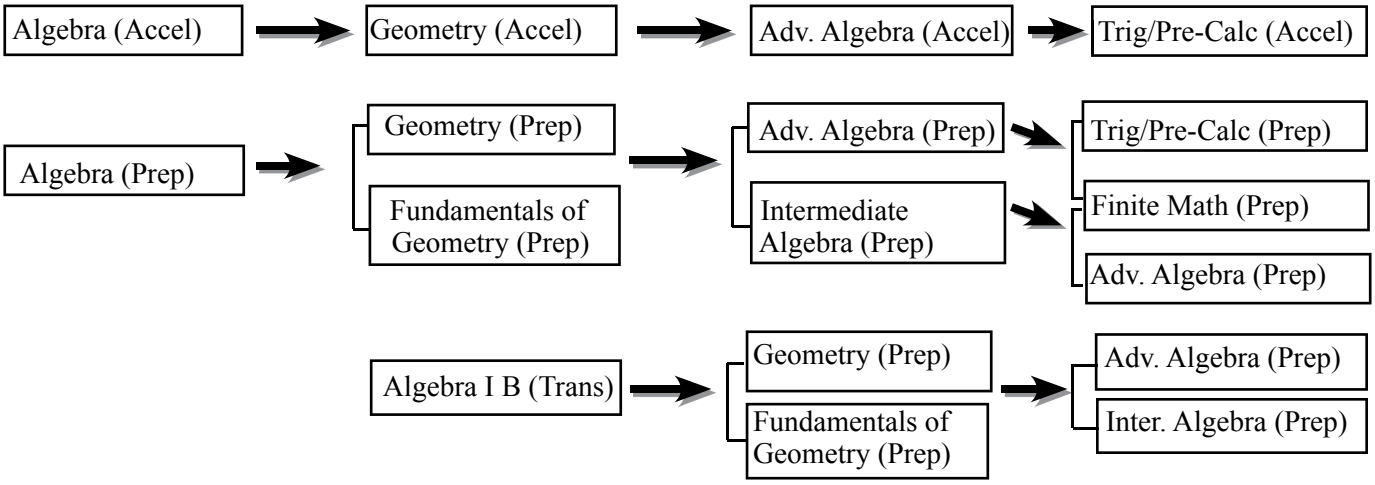
Mathematics Department Philosophy

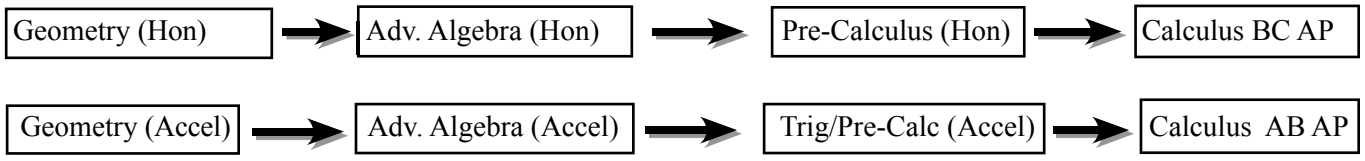
The mathematics curriculum has been developed to help students value mathematics, become confident in their abilities to do mathematics, become mathematical problem solvers, and to communicate and reason mathematically. Students, as a result of the high school mathematics experiences, should be able to model problems with the appropriate operations and equations, apply a variety of approaches and techniques to solve problems, understand the underlying mathematical features of problems, see the applicability of mathematical ideas to common and complex problems, use logical reasoning to present a cogent argument, and employ technology to explore mathematical ideas and solve problems.

Regular Sequence



Advanced Sequence

Students who successfully completed Algebra (Accel) in Grade 7 or 8 and received a satisfactory score on the semester finals will receive one unit of high school credit on a pass/fail basis and are eligible for one of the following mathematics sequences. The high school credit will be awarded after successful completion of one year of mathematics at the high school.



Other Electives

South Campus 9-10

- Seminar I - Math

North Campus 11-12

- Computer Science A AP
- Statistics AP
- IDW

Mathematics Department Standards

The LTHS Mathematics Department has adopted the following 8 principles in conjunction with the Illinois state standards for student learning. These principles and standards guide academic programs, courses and challenge students. Additionally, specific academic course standards have also been developement. These are distributed to students at the beginning of each semester or annual course.

LTHS Mathematics Principles

Common Core State Standards for Mathematical Practice

Standard I	**Make sense of problems and persevere in solving them.**
Standard II	**Reason abstractly and quantitatively.**
Standard III	**Construct viable arguments and critique the reasoning of others.**
Standard IV	**Model with mathematics.**
Standard V	**Use appropriate tools strategically.**
Standard VI	**Attend to precision.**
Standard VII	**Look for and make use of structure.**
Standard VIII	**Look for and express regularity in repeated reasoning.**

Requirements

While a minimum of three years of high school mathematics is required for graduation, many students take four years of mathematics. The state of Illinois requires each student to take an Algebra and a Geometry class for two of the three required credits. It is suggested that students who desire to attend college study requirements specific to their school of interest. Most state universities in Illinois require three years of mathematics through Advanced Algebra for unconditional admission. Pre-Calculus may also be required.

Placement

The Division Chair evaluates the performance of each incoming student. Placements is based upon an integrated analysis of the following performance indicators.

- Standardized test scores on the EXPLORE
- Information from the eighth grade teachers

After the initial placement of incoming freshman using EXPLORE scores, 8th grade teachers review the results and recommend further changes based on skills and supports. Parents are then notified of the final placement.

Students who have completed Algebra (Accel) in the seventh or eighth grade are given a two-part, two-day test. These tests are given by their 8th grade teacher as the final semester exams for the course. Until the final test scores are received in June, placement for these student will be listed as "math to be assigned". Students must achieve specific scores on the final exams and the EXPLORE test for placement into Geometry (Honors) or Geometry (Accel). Parents will be notified in June by letter regarding final placement.

Incoming Freshmen

Students who are placed beyond Algebra (Accel) will receive credit for Algebra only after s/he has successfully completed Geometry (Accel) or Geometry (Honors). Please note that credit will not appear on the student's transcript until the end of the first semester of the sophomore year. This credit will not apply to the three years of math credit required by the state of Illinois for high school graduation, nor will the level be designated.

Due to the sequential nature of mathematics courses, students who receive F's for first semester grades may have a level change, be dropped to a different course, and/or enter a staggered semester course.

Calculator Requirements

All Math courses require a Texas Instruments TI84+ graphing calculator.

- Calculators are available in area stores, through LTHS at freshman processing, and the LTHS Bookstore.
- Calculators will be provided to students on free and reduced lunch plans. Students and parents should contact the Bookstore in this instance.

Mathematics and Advanced Placement (AP)
A student may enroll in the following mathematics AP courses:

1. **Calculus AB AP** Students who have successfully completed Trig/Pre-Calculus (Accel) may enroll in Calculus AB AP. This two-semester course is especially designed for strong students with interest in mathematics and/or science. Completion of this course qualifies students to take the Calculus AB AP Examination.

2. **Calculus BC AP** Students who have successfully completed Pre-Calculus (Hon) may enroll in Calculus BC AP. This two-semester course is especially designed for excellent students with high interest in mathematics and/or science. Completion of this course qualifies students to take the Calculus BC AP examination.
3. **Computer Science A AP** College-bound students who have completed Advanced Algebra (Prep) or the equivalent may enroll in Computer Science A AP. This two-semester course is especially designed for students interested in programming language, such as JAVA, data structures, algorithms, and computer applications. Completion of this course qualifies students to take the Computer Science A AP examination.

4. **Statistics AP** Students who have successfully completed Advanced Algebra (Prep) or the equivalent may enroll in Statistics AP. This two-semester course is especially designed for strong students with an interest in an introductory, non-calculus based course in statistics. This course does not satisfy a college trigonometry requirement. This course qualifies students to take the Statistics AP examination.

Algebra I B (Trans)

Credit: 1 | Level: II
Grade Offered: 11 | Annual | MA4121, MA4122

Prerequisite: Algebra IA

This curriculum will continue the program begun in Algebra IA. The emphasis is on communicating mathematically through writing, reading, and discussion. Critical thinking and reasoning are emphasized. Topics studied, with the use of technology include exponential functions, rational functions, systems of equations, equivalent equations, properties of equations, solving equations and inequalities, ratio and proportion, radicals, and factoring polynomials.

Algebra (Prep) 131/132

Credit: 1 | Level: III
Grade Offered: 9,10 | Annual | MA4136, MA4137

Prerequisite: None

This introductory course in algebra intensively studies the language of algebra. Students begin their study of the real number system and its properties. The course is designed to convey an understanding of the meaning and use of variables, formulas, equations and inequalities, exponents, functions, graphs, and an introduction to probability and statistics. The fundamental processes with algebraic expressions are taught, including simple cases of factoring and work with algebraic fractions. The significance of problems and of problem solving is emphasized throughout the course. Material covered in this course will not only provide students with a foundation of algebra to be applied in future courses, but will also prepare for students for college level course work.

Seminar I - Math

Credit: 1/2 | Level: III
Grade Offered: 9, 10 | Fall | ST0816
Spring | ST0817

Prerequisite: Division Chair approval

Seminar I-Math is a course that offers support for students that are enrolled in Algebra (Prep). Seminar I-Math focuses on activities and instruction to develop mathematical skills and reinforce mathematical concepts. The class is taught by a math teacher. ALEKS, a computer-based mathematics instructional tool, will complement teacher instruction. Students who struggle in Algebra (Prep) during the first six weeks of each semester will be encouraged to enroll. Students can enroll in the course as an annual, fall only, or spring only course.

Did You Know?

The National Science Foundation estimates that 80% of the jobs created in the next decade will require some form of math and science skills.

Real advice about actuary jobs:
As with many other financial jobs, communication skills are almost as important as mathematical savvy. "Students planning an actuarial career can choose a school that offers an actuarial science major, or take appropriate courses in calculus, probability, statistics, accounting, economics, and finance to be prepared to learn actuarial techniques and applications."

American Council on Education, Sept. 2008

- An asterisk (*) following "credit" indicates a course which is applied toward the Practical Arts graduation requirement.
- **Independent Study** Under specific conditions as outlined on p. 25 of the **Guide**, students may make application for Independent Study. In all cases, students must secure parent, teacher, counselor, divisional, and building administration approval. Independent Study may not be taken as an 8th semester/annual course.

Algebra (Prep) 131/132 (staggered)

Credit: 1/2
Level: III
Grade Offered: 9, 10
Spring MA4937
Fall MA4936
Prerequisite: Failure in Algebra 1A, Algebra 1B or Algebra Prep

In this beginning course in algebra, the language of algebra is studied intensively. Students begin their study of the real number system and its properties. The course is designed to convey an understanding of the meaning and use of variables, formulas, equations and inequalities, exponents, functions, and graphs. The fundamental processes with algebraic expressions are taught, including simple cases of factoring and work with algebraic fractions. The significance of problems and of problem solving is emphasized throughout the course.

Seminar I - Math (staggered)

Credit: 1/2
Level: III
Grade Offered: 9, 10, 11
Fall ST0896
Spring ST0897
Prerequisite: Division Chair approval

Algebra (Accel) 141/142

Credit: 1
Level: IV
Grade Offered: 9
Annual MA4146
MA4147
Prerequisite: None

In Algebra (Accel), the language of algebra is studied intensely. Students begin their study of the real number system and its properties. The course is designed to convey an understanding of the meaning and use of variables, formulas, equations and inequalities, exponents, functions, and graphs. Several real life applications are used to enhance these concepts. The significance of word problems and of strategic problem solving is emphasized throughout the course. Algebra (Accel) moves at a quicker pace than Algebra (Prep) and requires proficiencies with and without the calculator.

Advanced Algebra w/Trigonometry (Prep) 231/232

Credit: 1
Level: III
Grade Offered: 11,12
Annual MA6231
MA6232
Prerequisite: Geometry (Prep)

This course focuses on reviewing and extending the main topics of Algebra. It contains an emphasis on both an algebraic and graphic approach to learning concepts. It includes the following topics: systems of equations, matrices, quadratic functions, polynomials, exponents, logarithms, complex numbers, conic sections, sequences and series, right triangle trigonometry, radian and degree measure, law of sines, and law of cosines. The method of presentation is designed to meet the needs of students who desire a strong four year mathematical foundation for future study of mathematics and science or preparation for post-high school entrance requirements.

Advanced Algebra w/Trigonometry (Accel) 241/242

Credit: 1
Level: IV
Grade Offered: 9, 10
Annual MA7246
MA7247
11
Annual MA7241
MA7242
Prerequisite: Geometry (Accel) or division chair approval

This course presents a more in depth treatment of the topics listed for Advanced Algebra (Prep) and also includes the topics of polynomial functions, matrices, logarithmic functions, sequences, series and probability. In addition, Advanced Algebra (Accel) will introduce many concepts necessary for Trig Pre-Calculus (Accel) such as the unit circle, trigonometric functions, law of sines, law of cosines, and radian measure.

Advanced Algebra w/Trigonometry (Hon) 251/252

Credit: 1 Level: V
Grade Offered: 9,10 Annual MA8256
MA8257
Prerequisite: Division chair approval

This course presents the topics contained in Advanced Algebra (Prep) and also includes the topics of polynomial functions, matrix equations, logarithmic functions, sequences, series, elementary probability, conic sections, and rational functions. Problem solving with the graphing calculator is a major emphasis in this course.

Calculus AB AP

Credit: 1 Level: V
Grade Offered: 11,12 Annual MA9551
MA9552
Prerequisite: Trig/Precalculus (Accel), Pre-Calculus (Hon), or division chair approval

Calculus AB AP is primarily concerned with developing the student's understanding of the concepts of calculus: Functions, graphs and limits, derivatives, and integrals. The course emphasizes a multi-representational approach to calculus with concepts, results, and problems being expressed geometrically, numerically, and verbally. Technology is used regularly by students and teachers to reinforce different representations of functions, to confirm written work, to implement experimentation, and to assist in interpreting results. Calculus AB AP is the equivalent of a semester of college calculus. Students who take this course should plan to take the Calculus AB AP Exam.

Calculus BC AP

Credit: 1 Level: V
Grade Offered: 11, 12 Annual MA9651
MA9652
Prerequisite: Pre-Calculus (Hon) or division chair approval

Calculus BC AP is primarily concerned with developing the student's understanding of the concepts of calculus: Functions, graphs and limits, derivatives, integrals, slope fields, and infinite series with its methods and applications. The course emphasizes a multi-representational approach to calculus with concepts, results, and problems being expressed geometrically, numerically, and verbally. Technology is used regularly by students and teachers to reinforce different representations of functions, to confirm written work, to implement experimentation, and to assist in interpreting results. Calculus BC AP is the equivalent of two semesters of college calculus. Students who take this course should plan to take the Calculus BC AP Exam.

Computer Science A AP

Credit: 1 Level: V
Grade Offered: 11,12 Annual MA9751
MA9752
Prerequisite: Algebra II (Prep), Advanced Algebra (Prep) or equivalent

This course is designed to prepare students for the Computer Science A AP exam. Using the JAVA language, students will study object-oriented program design, program implementations, program analysis, standards data structures and algorithms, and computing in context. Topics will include class and method design, JAVA library classes, arrays and array lists, sorting and searching, recursion and the Grid World Case Study. A minimum of 60% of class time will be spent working on programs and lab activities.

Finite Math (Prep)

Credit: 1/2 Level: III
Grade Offered: 12 Fall MA3831
Spring MA3832
Prerequisite: Intermediate Algebra (Prep) (B or better), Advanced Algebra (Prep)

This course is an introduction to business applications of Advanced Algebra. Finite math is used extensively in business for inventory management, optimizing manufacturing operations, finance, and banking. Course topics include: finance, matrix applications, linear programming, probability, and introduction to statistics. In addition to daily calculator use, and daily homework, there are two independent research projects where students apply finite math to personal real-life applications.

Geometry (Prep) 131/132

Credit: 1 Level: III
Grade Offered: 10 Annual MA5136
MA5137
11,12 Annual MA6131
MA6132
Prerequisite: Algebra IA/IB (Trans) with a C or better or Algebra (Prep) with a C or better

This course includes a thorough investigation of the theorems and properties of Euclidean geometry, including: lines, angles, polygons, circles and 3-dimensional solids. Students will develop an understanding of logic, reasoning and proof, and apply existing knowledge of algebra to geometric concepts. Students will investigate the definitions of sine, cosine, and tangent for acute angles of right triangles using the Pythagorean Theorem.

Fundamentals of Geometry (Prep) 121/122

Credit: 1 Level: III
Grade Offered: 10 Annual MA5126
MA5127
11, 12 Annual MA6121
MA6122
Prerequisite: C or below in Algebra IA/IB or C or below in Algebra (Prep)

This course allows students to explore the core concepts of geometry through discovery learning. Students will utilize computer software, manipulatives, and work collaboratively to learn various concepts. In this course, students will acquire geometric principles and facts, develop an understanding of logical reasoning, and apply these skills in mathematical situations. This course will also offer students the opportunity to review and apply their knowledge of algebra. Unit projects will be given to enhance the material presented in class and incorporate real world type problems. Course topics include measurement, polygons and their properties, trigonometry, area, surface area, volume, and properties of circles. Students will find that this course makes connections to a variety of careers including: architecture, engineering, interior design, and construction.

Fundamentals of Geometry 121/122 (staggered)

Credit: 1 Level: III
Grade Offered: 10 Spring MA5927
11, 12 Spring MA6922
Fall MA6921
Prerequisite: Failure of 1st semester Geometry (Prep) or Fundamentals of Geometry (Prep)

Geometry (Accel) 141/142

Credit: 1 Level: IV
Grade Offered: 9, 10 Annul MA7146
MA7147
Prerequisite: Algebra (Accel) or division chair approval

This course includes topics devoted primarily to plane Euclidean geometry, studied both synthetically (without coordinates) and analytically (with coordinates). Students will begin to formalize their geometry experiences using definitions and developing careful proofs. Students will learn the correspondence between numerical coordinates and geometric points, as well as the attributes and relationships of geometric objects so that they can apply skills from algebra to geometry in a more diverse context. The concepts of congruence, similarity, and symmetry are taught using geometric transformations. Students will investigate the definitions of sine, cosine, and tangent for acute angles of right triangles using the Pythagorean Theorem.

Geometry (Hon) 151/152

Credit: 1 Level: V
Grade Offered: 9 Annual MA8166
MA8167
Prerequisite: Division chair approval

This course includes all the topics in Geometry Accel at a greater depth and faster pace. Students in this course will study coordinate geometry problems, locus problems, and various enrichment topics. Additionally, right triangle trigonometry and conics will be investigated. Material covered in this course will help prepare students for college level calculus courses.

Geometry/Trig (Hon) 151/152

Credit: 1 Level: V
Grade Offered: 10 Annual MA8156
MA8157
Prerequisite: Advanced Algebra (Hon) or division chair approval

This course includes all the topics in Geometry (Accel) at a greater depth and faster pace. Students in this course will study coordinate geometry problems, locus problems, and various enrichment topics. During the second semester, trigonometric and circular functions and their properties are examined through an understanding of the unit circle. Additionally, right and oblique triangle trigonometry will be investigated. Material covered in this course will help prepare students for college level calculus courses.

Intermediate Algebra (Prep) 221/222

Credit: 1 Level: III
Grade Offered: 11, 12 Annual MA4221
MA4222
Prerequisite: Fundamentals of Geometry or Geometry (Prep) and teacher recommendation or division chair approval

This course provides a comprehensive review of Algebra topics and skills, including a focus on order of operations, solving linear equations and inequalities,

graphing and writing equations of lines, solving systems of linear equations, and applications. This course will also introduce Advanced Algebra topics including solving quadratic equations, exponents and radicals, higher degree polynomial functions, conic sections, and rational functions. In additions, finite topics of trigonometry, statistics, probability and finance will also be introduced. This course is designed to improve students' Algebra skills and introduce them to the topics of Advanced Algebra as well as some Finite topics.

Intermediate Algebra (Prep) 221 (staggered)

Credit: 1/2 Level: III
Grade Offered: 11, 12 Spring MA4922
Prerequisite: Staggered Fundamentals of Geometry

This spring semester course will introduce students to Advanced Algebra concepts in preparation for Advanced Algebra Prep in the Fall.

Pre-Calculus (Hon) 351/352

Credit: 1 Level: V
Grade Offered: 10, 11 Annual MA8351
MA8352
Prerequisite: Algebra II (Hon), Advanced Algebra (Hon) and Geometry/Trig (Hon)

This course is an extensive study of functions, advanced topics in trigonometry, matrices, combinatorics, statistics, and other topics in discrete mathematics. Calculator graphing technology is incorporated into the class in order to learn mathematics from a multifaceted approach.

Statistics AP

Credit: 1 Level: V
Grade Offered: 11, 12 Annual MA9451
MA9452
Prerequisite: Advanced Algebra (Prep) or above

This course is a first course in college level statistics. Most college majors and most careers including education, health care, business, engineering, and the social sciences, all require knowledge of statistics. Successful completion of this course prepares students for the AP Statistics exam. Course topics include: descriptive statistics, linear regression, design of experiments, an in depth study of probability, and 10 weeks of inferential statistics, including hypothesis tests and confidence intervals. Strong writing skills are as important as strong algebra skills to succeed.

Trig/Pre-Calculus (Prep) 331/332

Credit: 1 Level: III
Grade Offered: 11, 12 Annual MA6331
MA6332
Prerequisite: Advanced Algebra (Prep) or (Accel) with a C or better or division chair approval

This course is a more in depth look at advanced algebra topics from a function perspective and is a pre-requisite for any student taking calculus in college. Course topics include: functions, polynomials, radicals, exponents & logarithms, sequences & series, trigonometry, parametric equations, and probability. Exploratory labs and calculator investigations will be the foundation for both reviewing concepts from Advanced Algebra and developing deeper connections between topics.

Trig/Pre-Calculus (Accel) 341/342

Credit: 1 Level: IV
Grade Offered: 11,12 Annual MA7341
MA7342
Prerequisite: Advanced Algebra (Accel) or division chair approval

This course is an extensive study of functions including trigonometric, linear, quadratic, polynomial, rational, exponential, logarithmic, and sequences. In addition, the topics of complex numbers, polar graphs, vectors, parametrics, limits, and continuity are studied. This is an extremely rigorous course and students who do not complete Advanced Algebra (Accel) with a B or better are cautioned about enrolling in the course. Students who complete this course with an above average grade of B or higher will be prepared for college calculus.

Career Internship Program

Credit: 1/2 (dc) Level: IV
Grade Offered: Fall MA5551
Spring MA5552
Summer MA5558, MA5559

This course is designed for the student who is seeking work experience in an area that wish to pursue as a career upon graduation or after attending college. The student will apply for the internship through the department that they wish to receive credit for the experience. The student will work a minimum of 90 hours during the semester for credit for the course. The student will have weekly contact with the supervising teacher, develop a culminating project based upon the experience, be evaluated by the supervising teacher and the employer for the final grade. The student is responsible for their own transportation to and from the work place. This course may be taken for dual credit. It is the sole discretion of each department team to recommend the student for a work internship, application does not guarantee admission.

Mathematics Classes

When choosing Annual Courses, you will need the first and second semester codes.

Freshman Courses

MA1005 Mathematics TBA
(for students in Algebra Accel in 8th grade)
MA1105 Mathematics No test
MA4136/7 Algebra Prep 131/132
MA4146/7 Algebra Accel 141/142
MA7146/7 Geometry Accel 141/142
MA8166/7 Geometry Honors 151/152
ST0816/7 Seminar I-Math

Spring Only
MA4937 Algebra Prep 131 (Staggered)
ST0817 Seminar I-Math (Staggered)

Sophomore Courses

Annual
MA4126/7 Algebra I B Trans
MA4146/7 Algebra Accel 141/142
MA4136/7 Algebra Prep 131/132
MA7246/7 Advanced Algebra Accel 241/242
MA8256/7 Advanced Algebra Honors 251/252
MA5136/7 Geometry Prep 131/132
MA5126/7 Fundamentals of Geometry
MA8351/2 Pre-Calculus Honors
MA7341/2 Trigonometry / Pre-Calc Accel
ST0816/7 Seminar I-Math
MA8156/7 Geometry/Trig (Honors) 151/152

Staggered Semester
Fall only
MA4936 Algebra Prep 132
ST0896 Seminar I-Math (Staggered)

Spring only
ST0897 Seminar I-Math (Staggered)
MA4937 Algebra Prep 131
MA5927 Fundamentals of Geometry 121

Junior and Senior Courses

Annual
MA4121/2 Algebra I B Trans
MA4136/7 Algebra Prep
MA4221/2 Intermediate Algebra Prep 221/222
MA6231/2 Advanced Algebra Prep 231/232
MA7241/2 Advanced Algebra Accel 241/242
MA9551/2 Calculus AB AP
MA9651/2 Calculus BC AP
MA9751/2 Computer Science AP
MA6121/2 Fundamentals of Geometry 121/122
MA6131/2 Geometry Prep 131/132
MA6331/2 Trig/Pre-Calculus (Prep) 331/332
MA8351/2 Pre-Calculus Hon 351/352
MA7341/2 Trigonometry/Pre-Calculus Accel 341/342
MA9451/2 Statistics AP

Fall or Spring
MA3831/2 Finite Math Prep
MA5551/2 Career Internship

Staggered Semester
Fall only
MA6921 Fundamentals of Geometry 122

Spring only
MA6922 Fundamentals of Geometry 121
MA4922 Intermediate Algebra Prep 221 (Staggered)