## Algebra

Algebra II
AP Calculus AB
AP Calculus BC
AP Statistics
Calculus III
College Algebra
Financial Algebra
Data, Probability \& Statistics
Geometry
Linear Algebra
Pre-Calculus
Career Internship Program

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## Mathematics Department Mission Statement:

To use the content of Math to develop ALL students into lifelong learners; adept at critical thinking, problem solving and collaborating.

## Course Sequences



Students who successfully completed Algebra (Accel) or Geometry (Honors) in Grade 7 or 8 will receive one unit of high school credit on a pass/fail basis. The high school credit will be awarded after successful completion of one year of mathematics while enrolled in high school.

## Mathematics Department Standards

The LTHS Mathematics Department has adopted the following eight principles in conjunction with both the Illinois State Standards and the Common Core State Standards. These principles and standards guide academic programs, courses and challenge students. Additionally, specific academic course standards have also been developed. 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 | Look for and make use of structure. |
| Standard VII | 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 course 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 the following performance indicators.

- Information from the eighth grade teacher's about the incoming freshman using current math grades and student ability.
- LT will review the results and recommend further changes based on skills and supports.
Parents are then notified of the final placement.


## Incoming Freshmen

Students who are placed beyond Algebra (Accel) will receive credit for Algebra only after they successfully completed Geometry. Please note that credit will not appear on the student's transcript until the end of the second semester of 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.

## Calculator Requirements

All Math/Science courses require a graphing calculator. Families should only purchase a graphing calculator if they do not already own one. Please call your student's math teacher if you have any questions.

## Mathematics and Advanced Placement (AP)

A student may enroll in the following mathematics AP courses:

- AP Calculus AB

This two-semester course is especially designed for students with interest in mathematics and/or science. Completion of this course qualifies students to take the AP Calculus AB Examination.

## - AP Calculus BC

This two-semester course is especially designed for students with high interest in mathematics and/or science. Completion of this course qualifies students to take the AP Calculus BC examination.

## - AP Statistics

This two-semester course is especially designed for students with an interest in an introductory, non-calculus based course in statistics. Many college majors require a statistics course. This course qualifies students to take the AP Statistics examination.

## Algebra (Prep)

Credit: 1
Grade Offered: 9, 10
Level: III
Annual MA4136
MA4137
Prerequisite: None
This course 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 students for college level coursework.

## Algebra (Accel)

| Credit: 1 |  |
| :--- | :--- |
| Grade Offered: 9 | Level: IV |
|  | Annual |
| Prerequisite: None |  |
| $l$ |  |

Prerequisite: None
This course 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 students for college level coursework.

## Algebra II (Prep)

| Credit: 1 |  | Level: III |  |
| :---: | :---: | :---: | :---: |
| Grade Offered: | 10 | Annual | MA6236 |
|  |  |  | MA6237 |
|  | 11, 12 | Annual | MA6231 |
|  |  |  | MA6232 |
| Prerequisite: | Geometry |  |  |
| This course presents the topics contained in Algebra II and also includes the topics of polynomial functions, logarithmic functions, sequences, series, elementary probability, and rational functions. Problem solving |  |  |  |

Prerequisite: Geometry
This course presents the topics contained in Algebra II and also includes the topics of polynomial functions, logarithmic functions, sequences, series, elementary probability, and rational functions. Problem solving
with the graphing calculator is a major emphasis in this course.

## Algebra II (Accel)

| Credit: 1 |  | Level: IV |  |
| :---: | :---: | :---: | :---: |
| Grade Offered: | 9, 10 | Annual | MA7246 |
|  |  |  | MA7247 |
|  | 11 | Annual | MA7241 |
|  |  |  | MA7242 |
| Prerequisite: | Geometry |  |  |

This course presents the topics contained in Algebra II and also includes the topics of polynomial functions, logarithmic functions, sequences, series, elementary probability, and rational functions. Problem solving with the graphing calculator is a major emphasis in this course.

## Algebra II (Hon)

| Credit: 1 |  | Level: V |  |
| :---: | :---: | :---: | :---: |
| Grade Offered: | 9, 10 | Annual | MA8256 |
|  |  |  | MA8257 |
|  | 11 | Annual | MA8251 |
|  |  |  | MA8252 |
| Prerequisite: Geometry |  |  |  |
| This course presents the topics contained in Algebra II and also includes the topics of polynomial functions, logarithmic functions, sequences, series, elementary probability, and rational functions. Problem solving with the graphing calculator is a major emphasis in this course. |  |  |  |

- 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 8 th semester/annual course.


## Geometry (Prep)

| Credit: 1 | Level: III <br> Grade Offered: 10 |
| :--- | :--- |
| Annual | MA5136 |
| Prerequisite: Algebra |  |

In this course, we will learn about and investigate the measurements and properties of lines, planes, angles, polygons, and solids as well as their interrelationships. This class will provide you the opportunity to grow as a critical-thinker and problem-solver all while applying your pre-existing knowledge of algebra to geometric concepts. We will utilize a variety of methods of logical thinking to write the following types of proofs: 2-column, paragraph, flow, and coordinate proofs.

## Geometry (Accel)

| Credit: 1 | Level: IV |
| :--- | ---: |
| Grade Offered: 9, 10 | AnnualMA7146 <br>  <br> Prerequisite: Algebra (Accel) <br> MA7147 |

In this course, we will learn about and investigate the measurements and properties of lines, planes, angles, polygons, and solids as well as their interrelationships. This class will provide you the opportunity to grow as a critical-thinker and problem-solver all while applying your pre-existing knowledge of algebra to geometric concepts. We will utilize a variety of methods of logical thinking to write the following types of proofs: 2-column, paragraph, flow, and coordinate proofs.

## Geometry (Hon)

Credit: 1
Grade Offered: 9, 10

Level: V
Annual MA8166
MA8167
Prerequisite: Algebra (Accel) or Teacher Recommendation
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.

## Pre-Calculus (Prep)

| Credit: 1 |  | Level: III |
| :--- | :--- | :--- |
| Grade Offered: | 11, 12 | Annual |
|  | MA6331 |  |
| Prerequisite: | Geometry and Algebra II and PSAT/ |  |
|  |  | NMSQT over 510 for Seniors |

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. Students who complete this course with an above average grade of B or higher will be prepared for Calculus in college.

## Pre-Calculus (Accel)

| Credit: 1 |  | Level: IV |
| :--- | :--- | :--- |
| Grade Offered: | 11, 12 | Annual |
|  | MA7341 |  |
| Prerequisite: | Geometry and Algebra II | MA7342 |

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. Students who complete this course with an above average grade of B or higher will be prepared for Calculus in college.

## Pre-Calculus (Hon)



Linear Algebra

| Credit: $1 / 2$ |  | Level: V |
| :--- | :--- | :--- |
| Grade Offered: | 11, 12 | Fall MA9951 |
| Prerequisite: | Successful completion of AP Calculus |  |
|  | AB or BC |  |

This course is the study of vectors and vector space. Topics include vectors, vector spaces, matrices, determinants, matrix algebra, linear independence, linear transformations, eigenvalues, eigenvectors, and applications of matrices and transformations. Approximately onethird of the course will involve the concept of mathematical proofs as applied to linear algebra. Students may receive three college credits with Moraine Valley upon successful completion of this dual credit course. (Only with Calc BC credit).

## Calculus III

| Credit: $1 / 2$ |  | Level: V |  |
| :--- | :--- | :--- | :--- |
| Grade Offered: 11,12 | Spring | MA9852 |  |
| Prerequisite: | AP Calculus BC |  |  |

This course is a one-semester post calculus course. The course covers topics in multivariable calculus. Included are vectors in two and three-dimensions, solid analytic geometry, differential calculus of several variables (including directional derivatives and gradients), and line and surface integrals. The course also includes linear algebra, a study of vector spaces in $n$-dimensional Euclidean space and over the complex numbers, inner product spaces, eigenvalues and eigenvectors, linear transformations, applications of vector spaces, and numerical methods. Students may receive four college credits with Moraine Valley upon successful completion of this dual credit course.

## Financial Algebra

| Credit: $1 / 2$ or 1 | Level: III |  |  |  |
| :--- | :---: | :--- | :---: | :---: |
| Grade Offered: | 11,12 | Fall MA6311 |  |  |
|  | Spring MA6312 |  |  |  |
| Prerequisite: | Algebra I and Geometry (Prep) |  |  |  |

Financial Algebra is a study of algebra and functions in a financial context. This course combines algebraic and graphical approaches with practical business and personal finance applications. This course encourages students to be actively involved in applying mathematical ideas to their everyday lives.
Financial Algebra is not apporved as a core course for NCAA eligibility.

| Credit: $1 / 2$ or 1 | Level: III |
| :--- | :---: |
| Grade Offered: | 11,12 |
|  | Fall MA6311 |
| Spring MA6312 |  |
| Prerequisite: | Algebra I and Geometry (Prep) |

$\begin{array}{lc}\text { Credit: } 1 / 2 \text { or } 1 & \text { Level: III } \\ \text { Grade Offered: } & 11,12 \\ & \text { Fall MA6311 } \\ \text { Spring MA6312 }\end{array}$
$\begin{array}{lc}\text { Credit: } 1 / 2 \text { or } 1 & \text { Level: III } \\ \text { Grade Offered: } & 11,12 \\ & \text { Fall MA6311 } \\ \text { Spring MA6312 }\end{array}$


## Data, Probability \& Statistics

Credit: $1 / 2 \quad$ Level: III
Grade Offered: 12 Fall MA6341
Spring MA6342
Prerequisite: Algebra II with Trigonometry
This course is for students who want to apply probability to real life events and data analysis to explore random processes. Topics covered will include: graphical displays, data analysis, modeling of random events, conditional probability, discrete probability, normal probability, expected value, binomial and geometric probability, and counting. Questions of investigation may include: How can we base decisions on chance? How can probability be used to simulate events and to predict future happenings? What are the benefits of simulating events as opposed to gathering real data? What basic statistics help me better understand the world?

## College Algebra (Prep)

| Credit: 1 <br> Grade Offered: | 12 only | Level: III <br> Annual MA6321 |
| :--- | :--- | :--- |
| Prerequisite: | Prerequisite: Algebra II with Trigonom- <br> etry (Prep) and math PSAT score <br> less than 510 |  |

College Algebra is designed to develop mathematical reasoning and maturity, to facilitate placement in college level mathematics, and to transition high school students to typical college grading policies. This year long course is designed for high school seniors who have taken a course comparable to Intermediate Algebra. The curriculum will be similar to that of MATH 0465 offered at the College of DuPage. Students must take both semesters.

## AP Statistics

Credit: 1
Grade Offered: 11, 12
Level: V
Annual MA9451
MA9452
Prerequisite: Algebra II
This course is an introductory 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.

## AP Calculus AB

| Credit: 1 |  | Level: V |  |
| :--- | :--- | :--- | :--- |
| Grade Offered: | 11,12 | Annual | MA9551 |
|  |  | MA9552 |  |

AP Calculus AB 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. AP Calculus AB is the equivalent of a semester of college calculus. Students who take this course should plan to take the AP Calculus AB Exam.

## AP Calculus BC

| Credit: 1 | Level: V |  |
| :--- | :--- | :--- |
| Grade Offered: | 11, 12 | Annual | MA9651 | MA9652 |
| :--- |

AP Calculus BC 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 experi-
mentation, and to assist in interpreting results. AP Calculus $B C$ is the equivalent of two semesters of college calculus. Students who take this course should plan to take the AP Calculus BC Exam.

## Career Internship Program

Credit: $1 / 2$ (dc)
Grade Offered: 11, 12

Level: IV
Fall MA5551
Spring MA5552
Summer MA5558 MA5559
This course is designed for a student who has already secured an internship in partnership with their LT teacher in this department. Detailed information about qualifying for a Career Internship Program class can be found on page 10 of the Guide. It is the sole discretion of each department team to recommend a student for a career internship. An application does not guarantee admission.

## Mathematics Classes

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

## Freshman Courses

Annual
MA4136/7 Algebra Prep
MA4146/7 Algebra Accel
MA7146/7 Geometry Accel
MA8166/7 Geometry Honors

## Sophomore Courses

Annual
MA4146/7 Algebra Accel
MA4136/7 Algebra Prep
MA6236/7 Algebra II Prep
MA7246/7 Algebra II Accel
MA8256/7 Algebra II Honors
MA5136/7 Geometry Prep
MA7146/7 Geometry Accel
MA8166/7 Geometry Honors
MA8356/7 Pre-Calculus Honors
MA7341/2 Pre-Calc Accel

Staggered Semester
Fall only
MA4936
Algebra Prep (staggered)

## Spring only

MA4937 Algebra Prep (staggered)

## Junior and Senior Courses

Annual
MA4136/7 Algebra Prep
MA6231/2 Algebra II w/Trig Prep
MA7241/2 Algebra II w/Trig Accel
MA9551/2 AP Calculus AB
MA9651/2 AP Calculus BC
MA6331/2 Pre-Calculus Prep
MA8351/2 Pre-Calculus Honors
MA7341/2 Pre-Calculus Accel
MA9451/2 AP Statistics
MA6321/2 College Algebra (Senior only)

## Fall or Spring

MA5551/2 Career Internship
MA6311/2 Financial Algebra
MA6341/2 Data, Probability \& Stats (Senior only)
Fall only
MA9951 Linear Algebra
Spring only
MA9852 Calculus III

