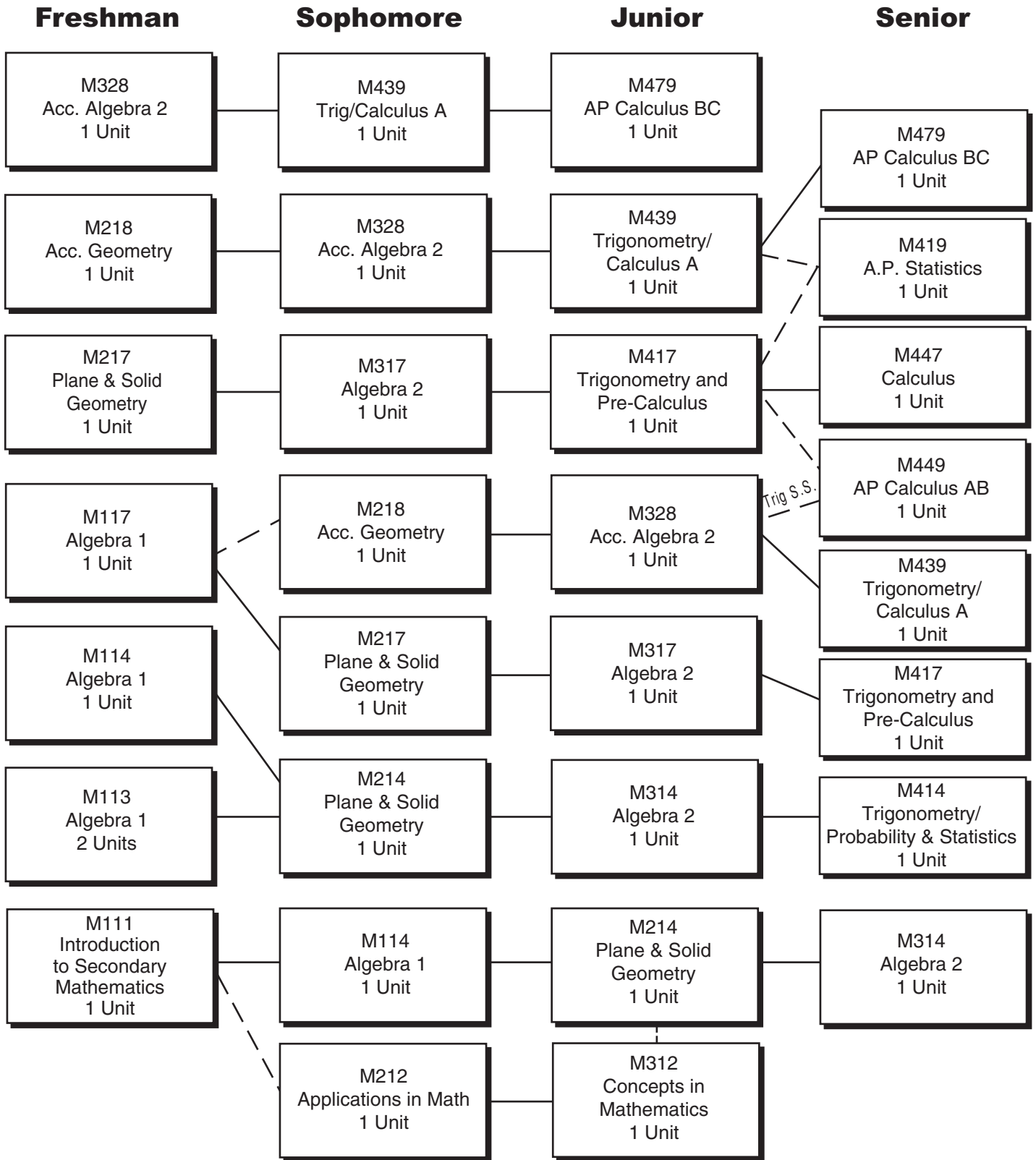
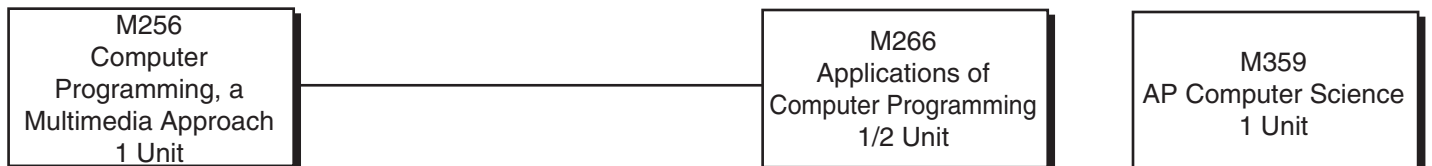


# 2020 Mathematics Course Flowchart



## Computer Science Electives

*Solid lines are mainstream sequences; dashed lines are alternate selections usually made through recommendation.*



All freshmen in High School District 211 enroll in a mathematics course. Placement at the freshman level is determined by entrance test scores and junior high school performance. A second year of mathematics is taken during the sophomore year and additional mathematics courses are required until the student successfully completes a 300 level course.

Freshmen who have successfully completed junior high school algebra may be placed in M217 Plane and Solid Geometry or M218 Accelerated Plane and Solid Geometry. Other freshmen may be placed in M117 Algebra 1, M114 Algebra 1, M113 Algebra I, M111 Introduction to Secondary Mathematics, M120 Essential Mathematics, or M100 Applied Mathematics 1.

A student who fails to meet the grade prerequisite for any course must repeat the requisite course to improve the grade in order to proceed to the next sequential course.

College-bound students are encouraged to complete four years of mathematics, including trigonometry.

The Mathematics Departments of High School District 211 provide honors and accelerated programs which allow students to complete up to three semesters of calculus leading to Advanced Placement examinations. Advanced Placement testing in computer science (JAVA) and statistics also are available.

## **M100 Basic Mathematical Applications**

This course is designed to teach students basic computational and money skills to increase the student's independence in the community. Money skills, whole number operations, time, and calculator usage are emphasized.

*PREREQUISITE: Placement through staff conference recommendation.*

*LEVEL: 1,2*

*One year*

*One unit*

## **M111 Introduction to Secondary Mathematics**

This course reinforces arithmetic skills, as their mastery is essential for continued study of mathematics. Pre-Algebra skills of variable recognition, signed numbers, formulas, and single variable equations are introduced as well as beginning geometry topics.

*LEVEL: 1,2*

*One year*

*One unit*

## **M113 Algebra 1**

This course reinforces skills needed for achieving middle/junior high school mathematics benchmarks of Illinois Learning Standards as well as the fundamental principles of algebra. Pre-algebra skills of variable recognition, signed numbers, formulas, and single variable equations are introduced as well as beginning geometry topics. Algebraic symbolism, simplifying expressions, solutions to elementary equations, and the graphic representations associated with variables will be introduced.

*PREREQUISITE: Acceptable performance on the entrance examination or department approval*

*LEVEL: 1,2,3*

*One year*

*Two units*

## **M114 Algebra 1**

This course introduces students to the fundamental principles of algebra. Algebraic symbolism, simplifying expressions, solutions to elementary equations, and the graphic representations associated with variables will be introduced.

*PREREQUISITE: M111 Introduction to Secondary Mathematics (A,B,C) or department approval; or acceptable performance on the entrance examination*

*LEVEL: 1,2,3*

*One year*

*One unit*

## **M117 Algebra 1**

This course introduces students to the fundamental principles of algebra. Algebraic symbolism, simplifying expressions, solutions to equations, and the graphic representations associated with variables are among the course topics. This course emphasizes the algebraic processes applied to word problems.

*PREREQUISITE: Acceptable performance on entrance examination*

*LEVEL: 1*

*One year*

*One unit*

## **M120 Essential Mathematics**

This course provides remediation in sequential mathematics skills with emphasis placed on the computation of whole numbers, fractions, decimals, and percents. Pre-algebraic expressions are introduced as well as problem solving and estimation.

*PREREQUISITE: Placement through staff conference recommendation*

*LEVEL: 1*

*One year*

*One unit*

### **M130-M630 Mathematics (Community-Based, Hoffman Estates High School Only)**

These courses are designed for student with significant communication deficits. Emphasis is placed on using mathematics within the community and real-life situations while demonstrating appropriate behaviors and utilizing effective communication skills. Student apply themselves in the areas of self care, domestic skills, recreation and entertainment, social skills, community involvement, and vocational skills. Functional mathematics skills of number writing/recognition, money skills, time skills, calculator skills, basic operations, and measurement skills are emphasized. Students are given added instruction according to each student's individualized needs.

*PREREQUISITE: Placement through staff conference recommendation*

*LEVEL: 1,2,3,4*

*One year*

*Two units*

### **M212 Applications of Mathematics**

This course reinforces the skills needed for achieving the high school mathematics benchmarks of the Illinois Learning Standards. A combination of algebra 1 and geometry topics, as specified by the ACT Pathways score ranges 13-15, will be targeted as well as WorkKey style questions of Level 3 and 4.

*PREREQUISITE: Department chair approval and one year credit in high school mathematics*

*LEVEL: 2,3,4*

*One year*

*One unit*

### **M214 Plane and Solid Geometry**

This study of geometry involves studying the axioms and theorems that relate points, lines, planes, and solids. An overview of plane and solid geometry is presented through geometric constructions, measurement formulas, and limited writing of formal proofs.

*PREREQUISITE: M114 Algebra 1 or M117 Algebra 1 (D)*

*LEVEL: 2,3,4*

*One year*

*One unit*

### **M217 Plane and Solid Geometry**

This comprehensive study of plane and solid geometry includes constructions, formulas for measurement, and formal proofs. It is based on the axioms and theorems that relate points, lines, planes, and solids. Algebraic techniques are integrated into the solution of many geometric problems.

*PREREQUISITE: M117 Algebra 1 (A,B,C) or acceptable performance on Algebra examinations*

*LEVEL: 1, 2*

*One year*

*One unit*

### **M218 Accelerated Plane and Solid Geometry**

This accelerated course is a comprehensive study of plane and solid geometry including constructions, formulas for measurement and formal proofs. It is based on the axioms and theorems that relate points, lines, planes, and solids. Many of the topics are covered in great depth, especially area and volume of solids. Additional emphasis is placed on the integration of algebraic techniques in solving geometric problems.

*PREREQUISITE: High performance on Algebra examinations or department approval*

*LEVEL: 1,2*

*One year*

*One unit*

### **M220 Algebra and Geometry Concepts**

This course reinforces skills needed for achieving early high school Illinois Learning Standards. It introduces ratios, proportions, integers, exponents, algebraic expressions, graphing, data, probability and beginning geometry topics.

*PREREQUISITE: Placement through staff conference recommendation*

*LEVEL: 2*

*One year*

*One unit*

### **M256 Computer Programming; a Multimedia Approach**

In a Windows environment, students are introduced to programming concepts using Visual Basic and/or HTML/JAVA Script. Student programs may incorporate graphics, sound, animation, or the construction of a web page.

*PREREQUISITE: Algebra I*

*LEVEL: 1,2, 3, 4*

*One year*

*One unit*

### **M266 Applications of Computer Programming**

Through independent study, students apply their computer programming skills to complete highly individualized projects.

*PREREQUISITE: M256 Computer Programming, A Multimedia Approach and department approval*

*LEVEL: 2,3,4*

*One-half year*

*One-half unit*

### **M312 Integrated Mathematical Topics**

This course reinforces the achievement of high school mathematics benchmarks of the Illinois Learning Standards. A combination of algebra 1, geometry, and algebra 2 topics, as specified by the ACT Pathways for Transition score ranges 16-19, will be targeted as well as Work Key style questions of Level 5 and 6. This course requires a graphing calculator.

*PREREQUISITE: Department chair approval and two years of credit in high school mathematics*

*LEVEL: 3,4*

*One year*

*One unit*

### **M314 Algebra 2**

This course reviews topics introduced in M114 Algebra 1 and expands upon them. All standard Algebra 2 topics are covered. The topics include methods of solving equations and inequalities, graphing techniques, conics, and logarithms. Students prepare for their study of trigonometry. This course requires a graphing calculator.

*PREREQUISITE: M214 Plane and Solid Geometry*

*LEVEL: 3,4*

*One year*

*One unit*

### **M317 Algebra 2**

This course is designed for students who have a good knowledge of algebra and geometry. Concepts presented in earlier course work are reviewed and expanded. The ideas presented involve advanced techniques of graphing, methods of solving equations and inequalities, and functions. Students are prepared to begin their study of pre-calculus. This course requires a graphing calculator.

*PREREQUISITE: M117 Algebra 1 (A,B,C) and M217 Plane and Solid Geometry*

*LEVEL: 2,3,4*

*One year*

*One unit*

### **M320 General Mathematics**

This course presents basic mathematics skills used in everyday situations including paying taxes, purchasing a car, banking, investing, and managing a household. A full year in this course meets the state of Illinois requirement for consumer education.

*PREREQUISITE: Placement through staff conference recommendation*

*LEVEL: 3*

*One year*

*One unit*

### **M328 Accelerated Algebra 2**

This accelerated course is designed for students who have an excellent knowledge of algebra and geometry. M328 Accelerated Algebra 2 briefly reviews concepts presented in earlier course work and then rigorously expands and applies them to other areas of mathematics. In addition, selected topics from pre-calculus are studied. The ideas presented in this course involve advanced techniques of graphing and solving equations and inequalities and prepares students to take M439 Trigonometry/Calculus A. This course requires a graphing calculator.

*PREREQUISITE: M218 (A,B) or department approval*

*LEVEL: 1,2,3*

*One year*

*One unit*

### **M354 Mathematics for Technology (Conant Only)**

This course introduces students to the basic principles of algebra, geometry, and trigonometry as it applies to problem solving and specific applications in the precision metalworking fields. The objectives closely follow the tool and manufacturing association curriculum. Students enrolled must be concurrently enrolled in M254 Machine Tool Technology. This course is eligible to all district students, but is currently taught only at Conant High School.

*PREREQUISITE: M114 Algebra 1 or M117 Algebra 1*

*LEVEL: 2, 3, 4*

*One year*

*One unit*

### **M359 Advanced Placement Computer Science**

The JAVA language allows the programmer to process data as well as perform mathematical calculations. In Advanced Placement Computer Science, data structures, programming algorithms, and structured programming are used. Students are expected to use analytical thinking in solving problems and use top-down design methods in developing programs.

*PREREQUISITE: Completion of M218 Accelerated Plane and Solid Geometry, or M317 Algebra 2; or M256 Computer Programming; A Multimedia Approach (A,B) with concurrent enrollment in M317 Algebra 2*

*LEVEL: 2,3,4*

*One year*

*One unit*

### **M414 Trigonometry, Probability, and Statistics**

This course introduces basic concepts of trigonometry including the six basic functions and their graphs, their inverse functions and the laws of sines and cosines. Also included will be probability, graph interpretation, and measures of central tendency.

*PREREQUISITE: M314 Algebra 2*

*LEVEL: 4*

*One year*

*One unit*

### **M417 Trigonometry and Pre-Calculus**

In the study of trigonometry, the student applies algebra and geometry skills to circular and periodic functions and rotational velocity. Many of the topics studied are developed as an extension of concepts introduced in earlier courses as a preparation for calculus. This course requires a graphing calculator.

*PREREQUISITE: M317 Algebra 2 (A,B,C)*

*LEVEL: 3,4*

*One year*

*One unit*

### **M419 Advanced Placement Statistics**

The study of statistics is now a requirement for many university majors. Students in this class will perform statistical tests on data sets using technology in order to organize, analyze, and predict outcomes. This course will follow the guidelines of the Advanced Placement Statistics program. Students are encouraged to take the Advanced Placement exam of the College Entrance Examination Board. This course requires use of a computer and graphing calculator.

*PREREQUISITE: M328 (with concurrent enrollment in M439), or M417, or M317 (with concurrent enrollment in M417), (A,B,C)*

*LEVEL: 3,4*

*One year*

*One unit*

### **M439 Trigonometry - Calculus A**

In the study of trigonometry, the student applies algebra and geometry skills to circular and periodic functions and rotational velocity. Additional time is spent on extending the trigonometry identities in the first semester. The second semester study of calculus is no longer limited to those preparing for careers in mathematics and the sciences. The need and demand for students in business and social studies who can design procedures, predict and relate the principles of higher mathematics are increasing dramatically. This course emphasizes the applications of differentiation. It is the first of three semesters of college-level calculus and satisfies the requirements for the first semester of calculus suggested by the Advanced Placement Program of the College Entrance Examination Board. This course requires use of a graphing calculator.

*PREREQUISITE: M328 Accelerated Algebra 2 (A,B) or department approval*

*LEVEL: 2,3,4*

*One year*

*One unit*

### **M447 Calculus**

The study of calculus is no longer limited to those preparing for careers in mathematics and sciences. This course emphasizes the skills of differentiation and integration. These students will not qualify for the Calculus AB Advanced Placement Examination. This course requires a graphing calculator.

*PREREQUISITE: M417 Trigonometry and Pre-Calculus*

*LEVEL: 4*

*One year*

*One unit*

### **M449 Advanced Placement Calculus AB**

The study of calculus is no longer limited to those preparing for careers in mathematics and the sciences. The need and demand for students in business and social studies who can design procedures, predict, and relate the principles of higher mathematics are increasing dramatically. This course emphasizes the various types and applications of differentiation and integration. Students are encouraged to take the Calculus AB Advanced Placement Exam of the College Entrance Examination Board. This course requires use of a graphing calculator.

*PREREQUISITE: M328 Accelerated Algebra 2 (A,B) and Trigonometry or M417 Trigonometry and Pre-Calculus (A)*

*LEVEL: 4*

*One year*

*One unit*

### **M479 Advanced Placement Calculus BC**

This course emphasizes applications of differentiation and integration in relationship to topics from trigonometry and college algebra. Calculus BC concludes the three-semester high school equivalent to two semesters of college-level calculus. The student is prepared to enter college with a strong calculus background. Students are encouraged to take the Calculus BC Advanced Placement Exam of the College Entrance Examination Board. This course requires a graphing calculator.

*PREREQUISITE: M439 Trigonometry-Calculus A*

*LEVEL: 3,4*

*One year*

*One unit*