QHS Mathematics Course Description

MATHEMATICS

A minimum of 3 credits in mathematics is required for graduation from Quincy Senior High School. Three years of mathematics, defined as Algebra I, Geometry, and Algebra II, are required for entrance into a state university in Illinois. Furthermore, 75% of all jobs today require at a minimum, a mastery of algebra and geometry concepts.

Even though the graduation requirement is only 3 credits of mathematics, students are strongly encouraged to take a math course all four years of high school. The culture of today's job market demands employees to be technological literate problem solvers. Therefore, each student should take as much math as possible with the completion of Algebra II as a **minimum**. The State of Illinois expects enrollment in a minimum of Algebra II during the junior year to meet the state learning standards.

The following courses are offered to students at Quincy Junior and Senior High Schools:

Grade	Regular Sequence	Accelerated 1 Year		Accelerated 2 Years	
7th	Pre-Algebra Pt 1	Pre-Algebra		Algebra I	
8th	Pre-Algebra Pt 2	Algebra I		Geometry	
9th	Algebra I	Geometry		Algebra IIA	
10th	Geometry	Algebra IIA	Algebra II	Pre-Calc	FST
11th	Algebra II	Pre-Calc	FST	AP Calc AB	Pre-Calc
12th	FST: Function, Statistics, and Trigonometry	AP Calc AB *or* AP Stats	Pre-Calc *or* AP Stats	AP Calc BC *or* AP Stats	AP Calc AB *or* AP Stats

Courses are split between two buildings:
- 7th – 9th Grades are at QJHS
- 10th -12th Grades are at QHS

Summer School for Credit Recovery *Only*:
- Algebra I
- Geometry
- Algebra II

QHS Mathematics Course Description

Algebra I   **Graduation requirement**

Prerequisite(s):   **Successful completion of Pre-Algebra**

Algebra I is a full year, one credit course, designed specifically to provide students with a strong foundation for success in Geometry, Algebra II and beyond. Students will learn about families of functions with a special emphasis on linear and quadratic functions. Students will represent functions in a multitude of ways including verbal descriptions, equations, tables and graphs. A strong emphasis is placed on basic math facts ***without*** a calculator. Algebra I is a requirement for graduation and a prerequisite for geometry.

Geometry   **Graduation requirement**

Prerequisite(s):   **Successful completion of Algebra I**

One of the chief objectives of geometry is to teach the student to think logically and clearly and to solve problems used in real world applications. Through careful and systematic reasoning, the student will learn to apply many properties of geometric figures. Students study each mathematical idea in depth through applications and practical problems. Students will learn to read mathematics on a daily basis. Provided are key concepts, relevant vocabulary, and meaningful examples. A project requiring an application of geometry is required.

Algebra II

Prerequisite(s):   **Successful completion of Algebra I**

Algebra II is a college-preparatory course geared toward the average student in mathematics. It is technology based and prepares students to use mathematics effectively in today‟s world. Independent thinking and learning are promoted emphasizing reading and problem solving. Geometry is integrated with the algebra throughout the year. Variation and graphs, linear relation, systems and equations, quadratic equations, powers and roots, and trigonometry are the course topics. A graphing calculator (TI-83+) is recommended. Functions-Statistics-Trigonometry should be taken by a college bound student to follow Algebra II.

Algebra IIA

Prerequisite(s):   **Exemplary completion of Algebra I**

Algebra IIA is a college-preparatory course geared toward the above-average student in mathematics. It is technology based and prepares students to use mathematics effectively in today's world. Independent thinking and learning are promoted emphasizing reading, writing, and problem solving. Geometry is integrated with the algebra throughout the year. Variation and graphs, linear relations, powers and roots, functions, applications with quadratic equations, applications with systems of equations with two and three variables, complex numbers, exponential functions, and trigonometry are the course topics. A graphing calculator such as the TI-83+ or TI-84+ is required. Functions, Statistics, and Trigonometry or Pre-Calculus should be taken by a college-bound student to follow Algebra IIA.

QHS Mathematics Course Description

Functions, Statistics & Trigonometry (FST)

Prerequisite(s): **Successful completion of Algebra II**

Functions, Statistics and Trigonometry is the normal 4th year course for the college bound or highly skilled work force bound student who has completed Algebra I, Geometry and Algebra II. Content includes topics functions, statistics, and trigonometry, as related to real world with business applications. The TI-83+ or TI-84+ graphing calculator is recommended.

Pre-Calculus   Grade Weighted

Prerequisite(s): **A or B in Algebra IIA or**
Successful Completion of FST

Pre-calculus is the 4th or 5th course in a college-preparatory mathematics sequence. This course is designed for students in mathematics who have completed Algebra I, Geometry, and Algebra IIA. Topics include analysis of functions, equations and inequalities, polynomials, rational functions, logarithmic functions, and trigonometric functions. All topics are grounded in real world application. The TI-83+ or TI-84+ graphing calculator is required.

Advanced Placement Statistics   Grade Weighted

Prerequisite(s): **Successful completion of FST, Pre-Calculus, or**
Calculus, and senior status

The Advanced Placement course in statistics introduces students to the major concepts and tools for collecting, modeling, analyzing, and drawing conclusions from data. Students headed toward college majors in journalism, business, education, social science, and natural sciences should take AP Statistics. Students are exposed to exploring data, planning a study, anticipating patterns, and statistical inference. Students in this class may choose to take the national AP exam. Whether or not students receive college credit by taking the AP exam will depend on their score and the policy of the college the student attends. A TI-83+ or TI-84+ graphing calculator is required. This course will prepare students to take the AP exam in May.

Advanced Placement Calculus AB   Grade Weighted

Prerequisite(s): **Successful completion of Pre-Calculus**

AP Calculus is the foundation course for all college majors requiring calculus. Students headed toward college majors such as business, medicine, social sciences, computer science, architecture, and mathematics or science education should take AP Calculus AB. Topics include analytic geometry, composition and analysis of functions, applications of the derivative and integral of algebraic and transcendental functions, slope fields and differential equations, and techniques of integration. A TI-83+ or TI-84+ fully graphing calculator is required. (The College Board currently restricts the use of all calculators with "QWERTY" keyboards from the AP exam; therefore the TI-92 cannot be used on the AP Exam). This course will prepare students to take the AP exam in May.

QHS Mathematics Course Description

Advanced Placement Calculus BC   Grade Weighted

Prerequisite(s):   AP Calculus AB

AP Calculus BC is the cornerstone course for college majors in the math-intensive sciences, mathematical sciences, and engineering. Topics include parametric curves, vector functions, polar graphs, and trigonometric integration by substitution and by partial fractions, sequence and series in addition to the topics in AP Calculus AB. A TI-83+ or TI-84+ fully graphing calculator is required. (Currently the College Board restricts the use of all calculators with "QWERTY" keyboards from the AP Exam; therefore the TI-92 cannot be used on the AP Exam.) This course will prepare students to take the AP exam in May.

Computer Programming in Visual Basic I

Prerequisite(s):   Keyboarding skills and Algebra I, "C" or higher

This course develops skills in the Visual Basic Language and in writing programs that utilize the computer as a tool in problem solving. Since much time is spent working with the computer, it is important that the students have the study skills, organizational skills, logical thinking skills, and math background necessary to work in an individualized manner and to meet deadlines. Students learn fundamentals of Visual Basic, how to create forms and write code for events, and a full range of Visual Basic syntax necessary for constructing beginning-level applications. The course takes the students through concepts fundamental to all programming languages: variables, expressions and statements, data types, flow control, strings, arrays, and files.

Computer Programming in Visual Basic II

Prerequisite(s):   Computer Programming in Visual Basic I

This course continues to develop skills in the Visual Basic language and in writing programs that utilize the computer as a tool in problem solving. Advanced topics in the Visual Basic language are covered. It is important that the student have the study skills, organizational skills, logical thinking skills, and math background necessary to work in an individualized manner and to meet deadlines. The course takes the students through concepts necessary for Visual Basic: tables, menus, coordinate graphic systems, color, lines, and circles, text, picture and image boxes, and code modules. The course takes the students beyond fundamentals and into advanced areas of algorithms and applications. This course is more substantially computer-science driven.