

MATHEMATICS OVERVIEW



PA

PRE-ALGEBRA (*Davidson Explore Only*): this preparatory course extends arithmetic concepts and operations, leading to the foundation of algebraic concepts and functions. Students will be taken from concrete approaches to abstract and symbolic levels of topics covered.

AI

ALGEBRA I (*available for Davidson Explore, DAO Full-time and Single Course options*): a middle school course that develops a deep understanding of algebraic functions and algebraic thinking. This course uses Exeter Mathematics.

G

GEOMETRY (*DAO Full-time and Single Course options*): our first high school credit course covers the applications of geometry, reviewing and expanding algebraic thinking, and learning to communicate with precision about mathematical arguments. This course uses Exeter Mathematics.

- Some students go straight from Alg I to Alg II, picking up the Plane Geometry course offered as a Friday elective sometime after taking Alg II.

- The University of California schools require the completion of a geometry course in HS (CBE [credit by exam] not accepted).

GRADUATION REQUIREMENTS

Four core Math Credits

DAVIDSON EXPLORE

Davidson Explore (DE) courses are offered through the Davidson Institute for Talent Development and not by the Davidson Academy. They are often taught by Davidson Academy staff.

WHAT IS EXETER MATHEMATICS?

The first two DAO math courses use Exeter's math program because this curriculum teaches students mathematical thinking rather than the traditional rote-style of math. Instead of textbooks, we use challenging problem sets designed to promote curiosity, exploration, connections, accuracy, ownership, and the habit of checking for reasonability.

Students tackle problem sets and take turns sharing putting their work and explaining their thinking to the class. In this way, everyone learns a variety of techniques and approaches, gaining the confidence to tackle mathematical challenges.

AII

ALGEBRA II: covers algebraic proofs, polynomial and rational functions, exponential and logarithmic functions, and more. Class alternates between theory days and works days and uses Sullivan's Precalculus text and MathXL online.

PC

PRECALCULUS: this course covers the rest of the Precalculus text. The content includes trigonometry, polar coordinates, vectors, limits, binomial theorem, and more.

AII/PC

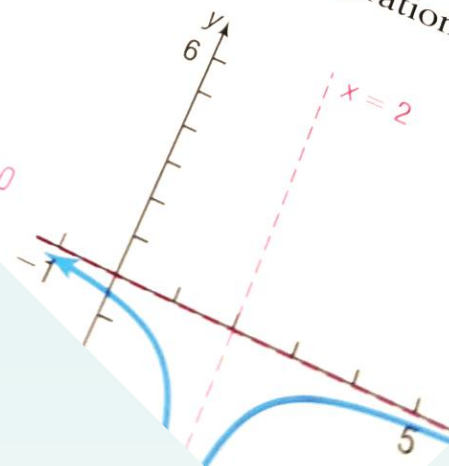
ALGEBRA II/PRECALCULUS: all Algebra II and Precalculus in one year. This class covers a new topic every day and requires consistent focus, attendance, and effort.

S

STATISTICS: this course covers experimental design, data collection and presentation, probability, statistical inference, and confidence intervals. This course currently does not require an understanding of Calculus, and students who are not continuing along the Calculus route may choose to take Statistics as their final HS credit.

CREDIT BY EXAM:

Students placed in a math class based on demonstrated knowledge of a lower level course will get a CBE. For example, if a student places into CALC I (without having had PRECALC), she will be given a CBE notation for PRECALC.



WHAT IS A FLIPPED CLASSROOM?

Many of our math classes are flipped classes in that students watch videos of the lectures and lessons at home, and then they work on the problem sets during live sessions. This allows students to review lessons as often as needed and get help from the teacher when working through problems.

CI

CALC I: covers chapters 1-9 in the Stewart Calculus text (limits and their applications, basic and complex derivatives and their applications, etc.). This year-long course takes a deeper dive into the material with more projects and applications than the semester-long option.

CII

CALC II: covers techniques of integration, numerical approximation, applications of integrals, etc. This class is widely considered to contain the most challenging material of all three levels of calculus, and like Calc I, this course goes deeper than the semester option.

I/II

CALC I/II: all Calc I and Calc II in one year. This class covers a new topic every day and requires consistent focus, attendance, and effort.

III

CALC III: this is a year-long course that covers vectors, dot products, planes in space, cylinders and quadratic surfaces, directional derivatives, etc.

"REPEATING" A COURSE

It is not unusual for students who have taken a certain level of math at another school to place into that "same" level here. That's because although the names are the same, the courses themselves can be very different. Our courses demand much higher level thinking, deeper understanding, and wider application of knowledge than most high school courses. So, even though it may seem like a step backwards, taking a course with the same name does not mean there won't be adequate challenge.

PLACEMENT IN MATHEMATICS:

Placement starts with an exam in June. The results of this exam determine initial placements, but the diagnostic period and sometimes 1:1 followup with teachers is also used to determine optimal placements. Students who are interested in a 2-in-1 Math course (Alg II/PreCalc and Calc I/ Calc II) must receive teacher approval after placement testing or the diagnostic period.

ADVANCING MORE QUICKLY IN MATH:

While we don't advise that students spend their summers studying, sometimes they do take a math course over the summer, and they are welcome to take a placement test later in the summer if they show proof of course enrollment.