

# Computer Science & Software Engineering Academy

Innovation • Design • Technology



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## OVERVIEW

In order to successfully graduate from the Computer Science Academy, student must complete 15. Credits of Computer Science in the academy courses. Students may begin courses after successful completion of Algebra I and will be required to meet minimum grade standards in each of the courses as they proceed.

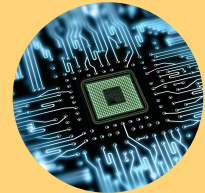
Along with introducing our students to key principles in computer science and software engineering, students will be prepared to take two Advance Placement Exams (AP) as part of their coursework. Additionally, students have the opportunity to receive transcribed college credit through Seton Hall University.

Like our ever-changing technologically-driven society, courses in the Computer Science Academy may change to provide our students with the most need skills that the field.



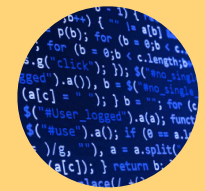
### Hands-on

Students learn to apply theory to real-world situations and product design.



### Future-Ready

DVRHS was one for the first schools in NJ to earn the "Future Ready" designation.



### Experienced

Our highly-qualified faculty come from STEM-education and engineering professional backgrounds.

# COURSE SEQUENCE AND DESCRIPTIONS

9

**Year 1 - AP Computer Science Principles** AP Computer Science Principles is a complete, full-year course developed in partnership with the University of Texas at Austin's UTeach Institute that focuses on the 5 "Big Ideas" in computer science using project-based approaches. The course introduces students to the creative aspects of programming, abstractions, algorithms, large data sets, the Internet, cybersecurity, and how computing impacts our world. Students will develop the computational thinking skills needed to fully exploit the power of digital technology and help build a strong foundation in core programming and problem-solving.

10

**Year 2 - Python Programming:** As the second course in the Computer Science Academy, this class provides students with a solid foundation in programming fundamentals using the Python programming language. Students will work with files and images, develop games using graphical user interfaces, use recursion to build animations, and create music using programming concepts.

11

**AP Computer Science A:** AP Computer Science A introduces students to computer science through programming. Fundamental topics in this course include the design of solutions to problems, the use of data structures to organize large sets of data, the development and implementation of algorithms to process data and discover new information, the analysis of potential solutions, and the ethical and social implications of computing systems. The course emphasizes object-oriented programming and design using the Java programming language. In addition to being able to gain college credit via the AP exam, students may enroll in Seton Hall's CSAS1111 course for four college credits.

12

**Year 4 - Computer Science Capstone:** This is the optional capstone course for students enrolled in the Computer Science Academy. Various topics related to student interest will be explored, including, but not limited to, Web Development Frameworks, Cybersecurity, Microcontrollers, Machine Learning and Data Science. Students will spend the second semester working on a Senior Capstone project.