The CaSE program seeks to develop computational thinking skills in students through the use of activity-, project-, and problem-based learning. Students work together and collaborate to develop applications and integrate technologies across multiple platforms, mobile devices, and networks. Students gain understanding of the ethical and legal principles applied to the management of data, and acquire an awareness of career and post-secondary opportunities involving computer and software engineering.

Students in the CaSE program will complete their experience by building authentic, real-world computer and software engineering applications to provide service to their school and community, demonstrating leadership, teamwork and collaboration skills through the development and delivery of these data applications.

The CaSE program uses a rigorous four-year high school Computer Science program of study from Project Lead The Way (www.pltw.org), a leading provider of science, technology, engineering, and math (STEM) programs.

CSE – Computer Science and Software Engineering: 1 Credit
Prerequisite: None.
Using Python® as a primary tool and incorporating multiple platforms and languages for computation, this course aims to develop computational thinking, generate excitement about career paths that utilize computing, and introduce professional tools that foster creativity and collaboration. CSE helps students develop programming expertise and explore the workings of the Internet. Projects and problems include app development, visualization of data, cybersecurity, and simulation. This course aligns with the AP Computer Science Principles course.

CSA – Computer Science Applications 1 Credit
Prerequisite: CSE – Computer Science and Software Engineering
CSA focuses on integrating technologies across multiple platforms and networks, including the Internet. Students collaborate to produce programs that integrate mobile devices and leverage those devices for distributed collection and data processing. Students analyze, adapt, and improve each other’s programs while working primarily in Java™ and other industry-standard tools. This course prepares students for the AP Computer Science-A course.

SAM – Simulation and Modeling: 1/2 Credit
Prerequisite: CSE – Computer Science and Software Engineering
In SAM, students create models and simulate social, physical, and biological systems. Students apply statistics and data analysis to understand systems and predict behavior, and they compare models to complex, real data. Students create simulations to communicate central ideas in the physical, biological, and social sciences and deepen their understanding of concepts in discrete math and computer science. This course emphasizes collaboration, professional writing, and the scientific method. It aligns with CSTA Level 3C Standards.

SEC – Cybersecurity: 1/2 Credit
Prerequisite: CSE – Computer Science and Software Engineering
SEC introduces the tools and concepts of cybersecurity and encourages students to create solutions that allow people to share computing resources while protecting privacy. Nationally, computational resources are vulnerable and frequently attacked; in SEC, students solve problems by understanding and closing these vulnerabilities. This course raises students’ knowledge of and commitment to ethical computing behavior. It also aims to develop students’ skills as consumers, friends, citizens, and employees who can effectively contribute to communities with a dependable cyber-infrastructure that moves and processes information safely. The course aligns with CSTA Level 3C Standards.

CPS – Computational Problem Solving (Capstone Course): 1 Credit
Prerequisite: Successful completion of program path (CSE, CSA, SAM, & SEC)
CPS offers students the opportunity to work in a team to deliver a software solution to a real-world design problem. Teams start by defining problems, which might originate from CPS students, community, or industry clients, or students in other problem-based courses, and use the Agile design process to develop a software solution. Effective practices in problem solving, documentation, software development, presentation, and collaboration are central to the course. The course aligns with CSTA Level 3C Standards.