**PLTW Computer Science Course Descriptions**

**Introduction to Computer Science (0.5 year)**
Designed to be the first computer science course for students who have never programmed before, Introduction to Computer Science is an optional starting point for the PLTW Computer Science program. Students work in teams to create apps for mobile devices using MIT App Inventor®. They explore the impact of computing in society and build skills in digital citizenship and cybersecurity. Beyond learning the fundamentals of programming, students build computational thinking skills by applying computer science to collaboration tools, modeling and simulation, and data analysis. In addition, students transfer the understanding of programming gained in App Inventor to text-based programming in Python® and apply their knowledge to create algorithms for games of chance and strategy.

**Computer Science Principles (1 year)**
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. While this course can be a student’s first in computer science, students without prior computing experience are encouraged to start with Introduction to Computer Science. Computer Science Principles helps students develop programming expertise and explore the workings of the Internet. Projects and problems include app development, visualization of data, cybersecurity, and simulation. The course curriculum is a College Board-approved implementation of AP CS Principles.

**Computer Science Applications (1 year)**
*Available 2016-17*
Computer Science Applications focuses on further developing computational thinking skills through the medium of Android™ App development for mobile platforms. The course utilizes industry-standard tools such as Android Studio, Java™ programming language, XML, and device emulators. Students collaborate to create original solutions to problems of their own choosing by designing and implementing user interfaces and Web-based databases. The course curriculum is a College Board-approved implementation of AP CS A.

**Cybersecurity (1 year)**
*Available 2018-19*
Cybersecurity 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 Cybersecurity, 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.

**Computational Problem Solving (1 year)**
*Available 2017-18*
As a capstone course, Computational Problem Solving offers students the opportunity to collaborate on diverse teams to develop a novel software solution that addresses a real-world need originating from local citizens or industry clients. Students apply computational thinking practices, interdisciplinary knowledge, and professional skills as they work through the software design process. Effective practices in problem solving, documentation, presentation, and collaboration are central to the course.