



# Foundations of Engineering and Computer Science

Scituate High School  
2018-19 Course Syllabus

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## **Course Description**

Foundations of Engineering and Computer Science (FECS) is the first level course for SHS's Career and Technical Education in the Engineering and Computer Science Pathways. FECS emphasizes learning through both individual and collaborative team projects. FECS is a hybrid course of two Project Lead The Way (PLTW) courses: 1) Introduction to Engineering Design and 2) Computer Science Essentials. Roughly half of the course will focus on each discipline.

In the engineering portion of the course, students will solve problems as they practice common engineering design and development protocols such as project management and peer review. Students will develop skill in technical representation and documentation of design solutions according to accepted technical standards, and they will use current 3D design and modeling software (Autodesk Inventor®) to represent and communicate solutions.

In the computer science portion of the course, students will be exposed to a diverse set of computational thinking concepts, fundamentals, and tools, allowing them to gain understanding and build confidence. Students use visual, block-based programming using MIT App Inventor 2 and seamlessly transition to text-based programming with languages such as Python® to create apps. They apply computational thinking practices, build their vocabulary, and collaborate just as computing professionals do to create products that address topics and problems important to them.

## **Required Resources**

All of the software and online material for the FECS course will be available to students in their classroom. Many of these resources are also available on any computer. While not a requirement, access to a home computer with internet will be an asset to students.

## **Grading Policies**

Since this is the first level course for both Engineering and Computer Science CTE Pathways, an emphasis is placed on acquiring the foundational knowledge and skills necessary for both. Once new material has been learned, students will engage in hands-on, real-world projects that utilize the new material. The grading for this course will be with the following category weightings:

50%	Assessments (quizzes, test, practical exams)
40%	Project completion
10%	Participation

A given assignment may be graded solely as an assessment, as a project completion, or in both categories. For example, a student's puzzle cube project will be evaluated based upon completion with certain aspects assessed for quality. The participation category grade will be given once a quarter to provide a cumulative evaluation how well a student is attending to their responsibilities as a student.

There will not be a final exam in this course, so the final grade will be the average of all four quarter grades. Nonetheless, students will take the PLTW End-of-Course (EoC) assessments for both IED and CSE to give them an opportunity to seek college credit for this course.

Students and parents/guardians are strongly encouraged to regularly monitor grades on PowerSchool. This is the primary method of communication from the teacher about progress in the classroom. Grades are entered in a timely manner so both the student and parents/guardians are constantly up to date on a student's performance. PowerSchool is available on both computer and phone platforms. For your convenience, PowerSchool also can provide notification when grades are added.

### **Course Topics**

- 1) Introduction to Engineering Design
  - a) Design Process
  - b) Technical Sketching and Drawing
  - c) Measurement and Dimensioning
  - d) Computer-Aided Design
- 2) Computer Science Essentials
  - a) Computer Logic & Coding Fundamentals
  - b) Block-based Programming
  - c) Text-based Programming

### **Safety**

Maintaining a safe classroom requires special attention in this type of course. The SHS Science teachers have taken specialized training in classroom laboratory safety, but students need to do their part as well. To this end, students and their parents will need to read and sign a safety contract (see <http://www.scituatescience.com/>). Please understand that safety rules are strictly enforced to ensure the safety of all students.

### **Class Rules**

The purpose of class rules is to foster and maintain the learning environment for all students. For this reason, students are expected to comply with all aspects of the SHS Student Handbook (see <http://scituateri3.net/shs02/index.php>) and SHS Science Student Policies and Expectations Handbook (see <http://www.scituatescience.com/>). Additional rules, procedures and expectations will be introduced at the beginning of the year. Students, parents and teachers have a shared responsibility to see that these rules are followed and the learning environment is optimum.



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## **Acknowledgement Form**

Please sign this acknowledgment form and return it to Dr. McCarthy as instructed.

### **Student**

I have read and understood this syllabus.

Student name (please print): \_\_\_\_\_

Student signature: \_\_\_\_\_ Date: \_\_\_\_\_

### **Parent/Guardian**

As the parent/guardian of the student above, I have reviewed this syllabus.

Parent/Guardian name (please print): \_\_\_\_\_

Parent/Guardian signature: \_\_\_\_\_ Date: \_\_\_\_\_

*Parents are encouraged to regularly monitor their child's progress on PowerSchool. If you have any questions or concerns, do not hesitate to contact Dr. McCarthy.*