

To ES 2 or to not ES 2?



School of
Engineering



The **Tufts School of Engineering (SoE)** has a computation requirement for many of its majors that can be satisfied via CS11 and/or ES2. Many students have questions about what course they should take. This (*currently unofficial*) document is meant to help students with making that decision.

Step 1: Check the Degree Sheets. Based on your year of matriculation and major (or intended major(s), if you haven't yet declared), see what computation requirement is needed (CS11? ES2? Both? Neither?). See go.tufts.edu/EngineeringDegrees

Step 2: Are you Exempt from ES2? If you have significant prior programming background, you may have enough experience to be exempt from ES2. This is determined via the *Exemption Exam for ES2*, typically given mid-October. See sites.tufts.edu/soefirstyear

Step 3: Consider the differences between CS11 and ES2. For degrees where either CS11 or ES2 satisfies the SoE computation requirement, you must think about which course you would like to take and how it'll support your future academic (classes) and professional (job) career.

CS 11: Introduction to Computer Science	ES 2: Introduction to Computing for Engineering
An introduction to computer science: primarily, a course on how to think precisely. <i>Clear thinking; clearly expressed.</i> If you have never programmed before, this course is for you — we'll teach you what you need to know! Specifically, we'll see how to understand and solve problems and reduce our solutions to precise, human readable, computer executable programs. We will employ four Big Ideas : <i>abstraction, modularity, divide-conquer-glue, and modeling</i> for problem solving, and we'll use the C++ programming language for our programs. You'll learn details about how modern computers work, and you'll also be introduced to the Linux operating system. See cs.tufts.edu/comp/11/	An introduction to engineering problem-solving with the aid of computational software. Scientific computing concepts will be introduced including number representation, arrays, structured programming techniques, and good coding practices. Basic numerical and data analysis methods will be introduced including numerical differentiation and integration, matrix operations, descriptive statistics, curve fitting, and optimization. Examples drawn from a variety of engineering disciplines will give students extensive practice in coding solutions and applying them to data. Course is taught using Matlab or Python as the programming language, depending on the section.
CS11 gives foundation to Computer Science and opens up all upper-level CS courses at Tufts. If you plan to take any other CS courses, or pursue a job in software engineering, CS11 gets you started in that direction.	ES2 provides an introduction to computing and has students explore examples of application to a wide variety of engineering disciplines and problems, with emphasis on data analysis, visualization, and communication.

Step 4: Consider the different sections of ES2. There are currently five sections of ES2 scheduled for Spring 2022, one taught using Matlab and four with Python, and instructed by different professors with different backgrounds from different departments. You should consider which one might be the best fit for you. See instructor bios at sites.tufts.edu/soefirstyear

Step 5: Consult with your academic advisor. Ask for their advice and recommendations!

This unofficial document was produced in Fall 2021. Please visit sites.tufts.edu/soefirstyear for updated information.