

CS313E: Elements of Software Design

The Elements Program

Dr. Bill Young
Department of Computer Sciences
University of Texas at Austin

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Computer science is the science of information and computation and their implementation and application in computer systems.

Computing and computer technology are part of just about everything that touches our lives. No matter what field you're entering, you simply can't be a fully functioning and educated citizen without some fluency in computing.

Computing jobs are among the highest paid and have the highest job satisfaction. The Bureau of Labor Statistics says computing has the “greatest potential for new jobs through 2014.”

Goals of the Elements Program

The Elements Program is for non-CS majors interested in learning about the enabling technology of our age. It aims to:

- Teach thinking and problem solving skills using computing technology.
- Provide an understanding of the technologies that are ubiquitous in the modern world and workplace.
- Provide technical skills to complement your major, *whatever your major may be.*

The Elements Certificate

For UTCS certification, students must complete 12 semester hours of Elements courses, including CS 303E or equivalent, and at least 6 hours of upper division courses. If you take 18 hours, UT will record your certification on your official transcript.

Two entry points to the Elements Program:

CS303E: Introduction to Programming Assumes the student has little or no programming background. Introduces Python or Java (or another scripting language).

CS313E: Elements of Software Design Typical starting point for a student with a year or more of programming in high school. Introduction to Python programming.

These provide a basic knowledge of programming and skills needed in subsequent courses.

CS301K: Foundations of Logical Thought

A basic introduction to logical thinking. What does it mean to solve a problem systematically? What are the tools that can be employed in thinking critically?

CS302: Computer Fluency

Basic familiarity with what computers are, how they work, and how they can be used to solve everyday problems through the study of algorithms – precise instructions for solving a problem. Also touches on the impact of computers on people and society.

The upper division courses allow the student to explore topics relevant to his/her major. Programming is required for some classes.

CS320N: Topics in Computer Science

- **Computers From the Ground Up**: build and program your own computer
- **Contemporary Issues in Computing**: address topics of the interaction of computing and society
- **Great Ideas in Computing**: what are the intellectual innovations that have driven the great success of computing
- **Visual Programming**: build complex “worlds” using a powerful graphical interface

CS320N may be repeated when the topic varies.

CS324E: Elements of Graphics and Digital Media

Understand basic 2-D and 3-D computer graphics systems and how to manipulate digital media. Study animation, game design, graphical user interfaces, and visual information presentation. (requires CS313E)

CS326E: Elements of Networking

Principles and basic concepts of the Internet and World Wide Web, including wired and wireless networks, security, privacy, and file sharing.

CS327E: Elements of Databases

Introduction to SQL and fundamentals of database technology to facilitate information searches. (requires CS313E)

CS329E: Topics in Elements of Computing

- **Elements of Computing in Society:** investigate the role of computing in society. Topics may include privacy, free speech on the Internet, newspapers vs. bloggers, defending against hackers, and copywrite laws
- **Elements of Navigating Cyberspace:** peek beneath the surface of the Internet to understand how cyberspace really works
- **Elements of Web Programming:** learn how to create your own Web presence

CS329E may be repeated if the topic varies.

Advantages of Elements Certificate

Becoming certified may help you to:

- Understand your world better
- Gain a competitive advantage in the workplace
- Become a more productive, more informed citizen
- Impress your friends and family

What Past Students Have Said

Employers like candidates with some technical background.

Helped me get an internship and excel in this job.

The Database class helped me during an internship, while the Networking class has enabled me to understand the Internet a lot better.