What is Exploring Computer Science?

Exploring Computer Science is...

A high school introduction to the world of computer science and problem solving. ECS is a K-12/University national program that includes curriculum and professional development (PD), committed to democratizing computer science knowledge by increasing learning opportunities at the high school level for all students, with a specific focus on access for traditionally underrepresented students. The ECS curriculum aligns well with many CS education standards.

Both the curriculum and PD were developed and refined over the course of 10 years based on research on effective practices for curriculum and PD. Three strands—equity, inquiry, and CS concepts—are woven throughout the curriculum and PD program.

For more information on the impact of ECS on teachers and students as well as papers describing ECS research related to impact and equity see www.exploringcs.org/for-researchers-policymakers/reports/research-publications

Impact

Since its founding in 2008, ECS has rapidly expanded across the country. ECS has local grants and hubs in a number of states and regions. The curriculum is currently taught in at least 34 states and Puerto Rico, including the 7 largest school districts, as well as some rural locations and reservations. ECS is a member of the national CSforAll consortium, which aims to increase access to and participation in CS across the U.S.

Over 55,000 students participated in ECS courses nationwide in 2018–19, with an additional 6,000 expected in 2019–20.

"Because of ECS, I recognize I am a problem solver and problems can be solved in a variety of ways." ECS Student

Equity

Equity is one of the core values of ECS. Research performed by ECS and others shows that teachers and students who are underrepresented in CS often encounter barriers to accessing meaningful learning opportunities and that diverse students thrive with diverse teachers. Therefore, ECS aims to reach teachers representative of the diverse students they teach.

We encourage teachers to aim for the demographics of their classroom to match that of their school and we offer relevant recruitment skills and tools.

ECS Curriculum

ECS is an introductory year-long high school computer science course focused on foundational computer science concepts and computational practices. The curriculum content is also informed by effective practices to engage underrepresented students.

Instructional Units:

1. Human Computer Interaction
2. Problem Solving
3. Web Design
4. Introduction to Programming
5. Computing and Data Analysis
6. Robotics

> *"I was inspired further to pursue computer science and computer engineering as my college major."*
>
> ECS Student

PD Requirements

As a requirement for participation in ECS PD, teachers must teach ECS in the fall after their first summer institute. They also must commit to participation in the full ECS PD experience: first summer, quarterly PDs through the year, and the second summer.

ECS PD as described above (2 summers plus quarterly sessions) has a cost of $5,400 per teacher plus a stipend of $2,800.*

*Cost estimated based on attendance at CSPdWeek and applies to Colorado teachers only.

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EXPLORING COMPUTER SCIENCE

PD Program

TWO YEAR MODEL:

2 summer week-long institutes + quarterly PDs throughout the year

- Three focus areas of PD: equity, inquiry, and CS concepts
- Designed around educational research findings that describe characteristics of effective STEM professional development
- Connected directly to supporting ECS course implementation
- ECS Teacher-Learner-Observer Model: teachers co-plan and co-teach ECS lessons, followed by lesson debrief discussion to discuss lesson strengths and areas for growth
- *Stuck in the Shallow End* (MIT 2008; Updated version 2017) research shapes discussions on equity and belief systems in computing classrooms and how this relates to equitable teaching practices in ECS
- Teacher leadership development opportunities provided

> *"The ECS PDs showed me that reflection and conversation with colleagues is one of the most important contributors to professional growth."*
>
> ECS Teacher

For More Information

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