Exploring Computer Science

AT A GLANCE

www.exploringcs.org

THE EXPLORING COMPUTER SCIENCE PROGRAM

ECS is a K-12/University national program 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.

CRITICAL COMPONENTS OF THE ECS PROGRAM

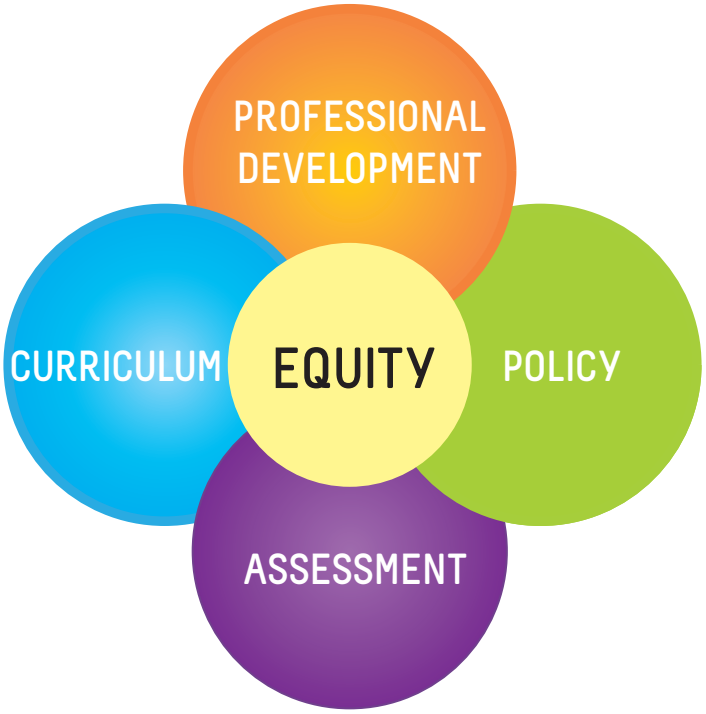
To carry out the mission of broadening participation in computing the ECS program has focused on the following essential areas: Curriculum, Professional Development, Assessment, and Policy. At the heart of our work is a commitment to Equity. For the 2012-13 school year, 43% of students taking ECS are girls and 90% are students of color.

CURRICULUM

- Introductory year-long high school computer science class focused on foundational computer science concepts and computational practices
- Instructional units: Human Computer Interaction, Problem Solving, Web Design, Introduction to Programming, Computing and Data Analysis, and Robotics
- Daily instructional lesson plans for teachers + supplemental extension resources
- An inquiry-based approach to teaching and learning frames the instructional design of the curriculum
- Culturally relevant lessons designed to be inclusive for all learners
- Modular design allows for substitution of topics for the final two units
- Mapped to national academic standards(NGSS & CCS) , national computing standards (CSTA & ISTE) and California and Illinois state standards(Math/ELA/CTE)
- ECS and CS Principles courses are conceptually and pedagogically aligned and supported by the CS10K project (NSF)

PROFESSIONAL DEVELOPMENT

- Two year model: Summer week long institutes + quarterly PDs throughout the year
- Three focus areas of PD: equity, inquiry, and CS content
- 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* 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
- Guiding philosophy: Teacher learning is a process over time



ASSESSMENT

SRI International is currently working with the ECS team to develop assessment measures that are aligned to the ECS course and Computational Thinking Practices. Field testing will take place during the 2013-2014 school year.

POLICY

- Working with local educational leaders to facilitate the offering of ECS in their school settings
- ECS granted status as college preparatory course and CTE in California (Approved as a “g” elective with Career Technical Education credit by the University of California Office of the President)
- Pre-service computing methodology course developed for mathematics and science teachers at UCLA
- Dissemination of materials to policy-makers to support increased access to CS knowledge for all students

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