



OPAS Initiative

<http://opas.ous.edu/>

CS Teaching, Learning & Outreach in Oregon K-12

June 2009

- **Engineering and Technology Industry Council (ETIC <http://www.oregonetic.org/>) Computer Science Task Force:** Industry, higher education, high school and non-profit stakeholders committed to developing the CS pipeline to OUS institutions.
 - Getreal website – <http://getreal.ous.edu/> -- career and Oregon post-secondary education information for computer science and engineering.
 - CS4HS (with TechStart Education Foundation – see below)
 - Oregon Game Project Challenge for middle and high school (with TechStart – see below)
 - Discrete/Digital Math Curriculum for High School (with TechStart – see below)
- **Oregon Pre-Engineering & Applied Sciences Initiative (OPAS)/ETIC collaboration with/ advice to the Oregon Department of Education (ODE)**
 - Graduation Requirements: by 2014 will include a third year of math, a third year of science, and opening the possibility of using CS to meet the math or lab science requirement -- <http://www.ode.state.or.us/teachlearn/certificates/diploma/diploma-timeline.pdf>
 - Math Standards: OPAS members are participating on the State Panel for Math Content and Assessment; the standards , adopted in June 2009, include discrete math as a way to meet graduation requirements -- <http://www.ode.state.or.us/teachlearn/subjects/mathematics/2009adoptedhighschoolmathstandards.pdf>
 - ODE is also looking at using applied academics, such as CS, to help students meet proficiency requirements for graduation -- <http://www.ode.state.or.us/pubs/eii/appliedacademicsbrief.pdf> -- and Career and Technical Education (CTE) and Math-in-CTE -- <http://www.lanecareerfocus.org/mathincte/index.html>
- **Oregon Pre-Engineering & Applied Sciences Initiative (OPAS) Bright Future Strategy**
 - A summary of the Bright Future Strategy -- http://opas.ous.edu//Workgroups2007/Bright_Future_Strategy_V4.pdf
 - Engineering Coach and Mentor Pilot Program (eCHAMP) -- <http://www.techstart.org/echamp/> -- pilot year funded by the Lemelson Foundation and Intel Foundation modeled engineering coaches in public schools analogous to athletics. Some of the pilot programs participated in the Oregon Game Project Challenge.
 - Documenting the connection between K-12 Out of School Time (OST) enrichment and choice of major through an on-line survey administered as a mandatory part of orientation for new engineering and CS students at OSU, OIT, and PSU, starting June 2009. Survey development was a collaboration between recruitment, admissions, outreach, and informal education stakeholders.
 - Expect to issue RFP in summer 2009 for cs4hs, CS Unplugged professional development and Discrete Math curriculum development and professional development.
- **Advanced Placement CS:** North Salem HS offers AP CS in the junior year of a 4-year program; Glencoe HS (Hillsboro) uses TeachScheme/ReachJava for Pre-AP CS; some high schools offer college credit through dual

credit programs with their local community college; most North Salem student opt for dual credit and do not take the AP CS test. We do not have detailed information on other schools at this time.

- **International Baccaureate:** North International High School in Eugene offers IT in Global Society (Standard Level) and Southridge High School in Beaverton offers Computer Science (Standard Level).
- **Career and Technical Education (CTE):** Oregon Department of Education 2007-2008 reports show 27 approved CTE programs in Programming and Software Development, with 4 in Information Support and Services and 2 in Interactive Media serving 3,943 students, the latest publicly available data. Because of changes in federal definitions and classifications, other courses of interest may be categorized elsewhere.
- **CS Course Articulation:**
 - **Oregon Council of Computer Chairs (OCCC)** promotes articulation of CS courses between university degree programs and community college programs -- <http://cs.bluecc.edu/occc/> .
 - **Community Colleges and high school** programs articulate locally through ODE-monitored programs such as Dual Credit and College Now -- <http://www.ode.state.or.us/search/results/?id=222>
- **Public University Programs**
 - OSU Tekbots: Improved instructional practice for undergraduates using a common platform across multiple classes in Electrical Engineering and Computer Science; one student pioneered the “TekPets” outreach program/model for middle school girls.
 - OSU Engineering Ambassadors – student speakers visit school classrooms with hands-on activities; some of these students are CS majors; most are from underrepresented demographics.
 - EOU hosts a local qualifying tournament for *FIRST* LEGO League; the winning team gets scholarships.
 - OIT hosts summer camps in LEGO robotics and Video Game Design.
- **TechStart Education Foundation, the charitable arm of the Software Association of Oregon**
 - Willamette/TechStart High School Programming Contest -- <http://www.techstart.org/willamette>
 - Oregon Computer Science Teachers’ Association (OCSTA) Conference
 - Oregon Game Project Challenge for middle and high school (with ETIC CSTF) -- <http://www.techstart.org/ogpc>
 - SuperQuest: K-12 Teacher Technology Training taught by teachers for teachers --
 - CS4HS (inaugural year 2009)
 - Robotics – LEGO RCX and NXT for classroom use; RoboLab, NXT-G, and RobotC
 - Programming, Web Design and Animation: GameMaker, Flash, Alice
 - 2008 Equity in the Classroom: Provided five schools with minigrants ranging from \$600-\$1,000 to recruit and implement STEM programs specifically targeting girls and racial minorities as a follow-up to a Best Practices implementation workshop; OPAS and TechStart staff recruited Best Buy to make an in-kind donation of more than \$4000 to classrooms and recruiting events such as NBA. Best Practice exemplars:
 - Salem/Keizer No Boys Allowed (NBA): 6 year old recruiting event and integrated CS/Honors Geometry curriculum enrolled 70 students including 30 girls for 2009-2010; the program was ported to a second school in 2009.
 - Hillsboro High School Use of ELL Aides in technology classrooms: ELL aides are tied to classroom and subject matter rather than to students -- http://opas.ous.edu//Workgroups2007/Succeed/Domes_05-06_Targeted_Populations_Experiment-11-2000.pdf

- Discrete/Digital math high school curriculum(with ETIC CSTF) – "Digital Math Curriculum Workshop" at Sherwood High School on August 7 to review curriculum standards and brainstorm and review modules for integration into math and computer science courses. Secondary goal is to establish 2 or 3 pilots for 2009-2010
- **Oregon Robotics and Tournament Outreach Program (ORTOP)** -- <http://www.ortop.org/>
 - The *FIRST* LEGO League portion of the program includes a programmed, autonomous robot performing a two-and-a-half minute challenge, and a session explaining design, programming and mechanical techniques, choices, and process to a panel of volunteer judges.
 - ORTOP launched the *FIRST* Tech Challenge for high school students in 2007; in 2008-2009 38 teams participated.
- **FIRST Robotics Competition** teams for high school students are organized by *FIRST* and its Oregon Regional Committee.
- **Saturday Academy** classes and Apprenticeships in Science and Engineering (ASE) Program: served 6273 students in 550 schools metro Portland and Corvallis in 2008, including classes/camps in LEGO robotics, physics, animation, C++, Cryptography, Games, Java , etc. and 8 week internships in research labs and industry -- <http://www.saturdayacademy.org/>
- **Business Education Compact (BEC) Student Intern Program** -- Hires high school and college students for a variety of positions, some of which work involves programming; students work at Intel and other companies -- <http://www.businesseducationlinks.org/pls/pdxlinksp/stusvcs.html>
- **Large Grants**
 - CPATH at OSU -- http://www.oregonetic.org/meetings/CStaskforce/CPATH_draft8_072307.pdf -- development of an open-source, ultramobile, low-cost computing device, a CS Platform for Learning, and an internal website that combines project planning with social networking -- <http://beaversource.oregonstate.edu/projects/cspf/>
 - CPATH at UO/PSU/Willamette -- <http://www.cpathi18n.org/> -- The goal of the cpathi18n project is to create and sustain a community of educators committed to internationalizing computer science education. Activities continuing beyond the original "community-building" grant period include creating distributed international software project courses, developing a series of articles on computer science education in the Pacific Rim, and developing curriculum recommendations for ACM and IEEE.