

HOUSE OF REPRESENTATIVES STAFF ANALYSIS

BILL #: CS/HB 1213 Computer Science Instruction
SPONSOR(S): PreK-12 Appropriations Subcommittee; Porter
TIED BILLS: None **IDEN./SIM. BILLS:** CS/SB 1056

REFERENCE	ACTION	ANALYST	STAFF DIRECTOR or BUDGET/POLICY CHIEF
1) PreK-12 Innovation Subcommittee	10 Y, 0 N	Brink	Healy
2) PreK-12 Appropriations Subcommittee	12 Y, 0 N, As CS	Seifert	Potvin
3) Education Committee	19 Y, 0 N	Brink	Hassell

SUMMARY ANALYSIS

Florida law requires school districts to provide students opportunities to participate in computer science education, including courses in computer programming and computer coding. However, only a small percentage of middle, high, and combination schools have students enrolled in computer science courses, including career and technical education computer science courses.

To increase opportunities for students to participate in computer science instruction, the bill:

- defines computer science and includes computer coding and programming in the definition;
- requires the Florida Department of Education (DOE) to identify computer science courses in the Course Code Directory and on its website by July 1, 2018;
- requires Florida Virtual School (FLVS) to offer computer science courses so students enrolled in a school without a computer science course can receive computer science instruction;
- requires school districts to offer students access to computer science courses through FLVS or by other means;
- establishes a grant program to help teachers earn a computer science educator certificate or industry certification and for paying associated examination fees;
- establishes a bonus program to award qualifying teachers, on a yearly basis for up to 3 years, who teach computer science courses identified by the DOE; and
- requires the State Board of Education to adopt rules to implement these provisions.

Funding for the teacher training grant program and teacher bonus program are subject to an appropriation.

The bill takes effect upon becoming a law.

FULL ANALYSIS

I. SUBSTANTIVE ANALYSIS

A. EFFECT OF PROPOSED CHANGES:

Present Situation

Computer Science Instruction

Public schools are required to provide students in grades K-12 opportunities for learning computer science including, but not limited to, computer coding and computer programming.¹

Such opportunities may include:²

- instruction regarding computer coding in elementary and middle school;
- instruction to develop computer usage and digital literacy skills in middle school; and
- courses in computer science, computer coding, and computer programming in high school, including opportunities to earn industry certifications related to the courses.

The law allows high schools to provide students opportunities to satisfy certain math and science graduation requirements by taking computer science courses of sufficient rigor and earning a related industry certification.³ To qualify, the course must be in the area of computer science or 3D rapid prototype printing and the Commissioner of Education must identify the course and the related industry certification in the Course Code Directory.⁴

A qualifying computer science course may satisfy up to one mathematics or science course credit, so long as the course is not Algebra I or higher-level mathematics or Biology I or higher-level science. A qualifying 3D rapid prototype printing course may satisfy up to two mathematics course credits, except for Algebra I.⁵

The Southern Regional Education Board recently identified five actions states can take to help address gaps in computer science instruction. The steps are:⁶

- Develop state computer science standards for K-12.
- Lay the groundwork for learning computer science (focus on essential literacy skills and math concepts and skills students need to master grade-appropriate computer science standards).
- Create clear pathways to computing careers by charging a state advisory council with developing pathways that meet identified workforce needs in computing fields.
- Prepare great computer science teachers through special training and certification pathways.
- Educate communities about computer science and computing careers by embedding career advisement and encouraging partnerships with employers.

In 2016, the State Board of Education revised the Next Generation Sunshine State Standards to include K-12 computer science standards.⁷ Currently, courses in computer coding are listed in the Career Technical Education Program and Course Listing section in the Course Code Directory.⁸ The Florida Department of Education has identified several general education courses and career and

¹ Section 1007.2616(1), F.S.

² *Id.*

³ Section 1007.2616(3), F.S.

⁴ *Id.*

⁵ *Id.*

⁶ See Southern Regional Education Board, *Executive Summary: Bridging the Computer Science Education Gap: Five Actions States Can Take* (Nov. 2016), available at http://www.sreb.org/sites/main/files/file-attachments/csexec_summary.pdf.

⁷ See rule 6A-1.09401(1)(n), F.A.C.

⁸ Staff of the Florida Department of Education, *Staff Analysis of Senate Bill 468* (2016).

technical education courses and programs that will incorporate the newly adopted computer science standards, including but not limited to:⁹

- Computer Science Principles;
- Integrated Information Technology;
- Database Application Development and Programming;
- STEM labs K-5; and
- Meteorology Honors for Grade 9-12.

Currently, only 9.6 percent of high schools in the state have students enrolled in a computer science course, with 9.1 percent having students enrolled in a career and technical education computer science course. Under 1 percent of combination schools have students enrolled in a computer science course, and only 0.2 percent of combination schools have students enrolled in a career and technical education computer science course. Thirty-three school districts do not have a high school or combination school offering any type of computer science course. Only one school district, Bay, has a middle school that offers a computer science course.¹⁰

There are 463 teachers who hold a DOE-issued educator certificate in computer science.¹¹

Digital Classrooms Allocation

To support the efforts of public school districts and schools to integrate technology in classroom teaching and learning, provide student access to high-quality electronic and digital instructional materials and resources, and empower classroom teachers to help their students succeed, each school district receives digital classroom allocation funds as provided in the General Appropriation Act.¹²

Digital classroom allocation funds must be used for costs associated with:¹³

- acquiring and maintaining the items on the eligible services list authorized under the federal E-rate program;¹⁴
- acquiring computer and device hardware and associated operating system software that comply with minimum technology requirements identified by the DOE's Office of Technology and Information Services, including specifications for hardware, software, devices, networking, security, and bandwidth capacity and guidelines for the ratio of students per device;¹⁵ and
- providing professional development, including in-state conference attendance or online coursework, to enhance the use of technology for digital instructional strategies.

The 2017 Legislature appropriated \$80,000,000 for the digital classrooms allocation. Each district was allocated a minimum of \$500,000.¹⁶ Twenty percent of the funds may be used for professional development.

⁹ Florida Department of Education, *Course and CTE Programs that Include the New Computer Science Standards for the 2017-2018 School Year*, Memorandum DPS: 2017-26 (Mar. 3, 2017).

¹⁰ Email, Florida Department of Education, Office of Governmental Relations (Dec. 21, 2017).

¹¹ Email, Florida Department of Education, Office of Governmental Relations (Jan. 17, 2018).

¹² See s. 1011.62(12)(a), F.S. (*as enacted by* s. 4, ch. 2017-116, L.O.F.)

¹³ See s. 1011.62(12)(b)1.-3., F.S.

¹⁴ Universal Service Administrative Co., *Eligible Services List*, <http://www.usac.org/sl/applicants/beforeyoubegin/eligible-services-list.aspx> (last visited Jan. 16, 2018).

¹⁵ See s. 1001.20(4)(a)1.b., F.S. See also Florida Department of Education, 2017-2019 *Strategic Technology Plan* (Aug. 2, 2014) at 5, available at <http://www.fldoe.org/core/fileparse.php/5658/urlt/0097843-fdoedigitalclassroomsplan.pdf>.

¹⁶ See s. 6, ch. 2017-234, L.O.F. The remaining balance was allocated based on each school district's share of the total kindergarten through grade 12 unweighted FTE student enrollment. See Florida Department of Education, 2017-18 *Funding for Florida School Districts* (2017) at 19, available at <http://www.fldoe.org/core/fileparse.php/7507/urlt/Fefpdist.pdf>.

Bonuses for Teachers of Advanced Courses and Courses Leading to Industry Certification

The Legislature allocates public education funding to Florida's school districts through the Florida Education Finance Program (FEFP). The FEFP is a funding formula that helps to equalize education funding among Florida's geographically diverse school districts and is the primary mechanism for funding the operating costs of Florida school districts, which among other things, includes the payment of teacher salaries.¹⁷ In addition to funding school district operating costs, the FEFP also includes funds for teachers of advanced courses, such as International Baccalaureate (IB) courses, Advanced International Certificate of Education (AICE) courses, and Advanced Placement (AP) courses, whose students earn specified scores on the course examinations.¹⁸

- *International Baccalaureate* bonus provides an IB teacher a \$50 bonus for each student who scores 4 or higher on the IB examination. An IB teacher in a "D" or "F" school who has at least one student scoring 4 or higher on the IB examination receives an additional \$500 bonus.¹⁹
- *Advanced International Certificate of Education* bonus provides an AICE teacher a \$50 bonus for each student in a full-credit AICE course, or \$25 bonus for a student in a half-credit AICE course, who scores "E" or higher on the AICE examination. An AICE teacher in a "D" or "F" school receives an additional \$500 bonus if one of the teacher's students scores "E" or higher on the full-credit AICE examination, or a \$250 bonus for each half-credit AICE course taught which has at least one student scoring "E" or higher on the half-credit AICE examination, not to exceed an additional \$500 bonus.²⁰
- *Advanced Placement* bonus provides an AP teacher a \$50 bonus for each of his or her students who scores 3 or higher on the College Board AP examination. An AP teacher in a "D" or "F" school who has at least one student scoring 3 or higher on the College Board AP examination receives an additional \$500 bonus.²¹

Yearly Teacher per-Student Bonuses by Advanced Course			
	IB	AP	AICE
Half Credit			\$25
Full Credit	\$50	\$50	\$50
Full Credit D Or F School	\$500 (per teacher)	\$500 (per teacher)	\$500 (per teacher)
Half Credit D Or F School			\$250 (per teacher)

FEFP funds are also used to provide bonuses for teachers who teach courses that lead to the attainment of a Career and Professional Education (CAPE) industry certification. Depending on the

¹⁷ See s. 1011.60, F.S. The performance salary schedule is funded from the same sources used to pay instructional personnel and school administrators under the grandfathered salary schedule.

¹⁸ Section 1011.62(1)(l)-(n), F.S.; *International Baccalaureate*, <http://www.ibo.org> (last visited Jan. 17, 2018); University of Cambridge, International Examinations, *Cambridge Advanced International Certificate of Education Diploma*, <http://www.cie.org.uk/qualifications/academic/uppersec/aice> (last visited Jan. 17, 2018); College Board, *Advanced Placement Program*, <http://www.collegeboard.com/student/testing/ap/about.html> (last visited Jan. 17, 2018).

¹⁹ Section 1011.62(1)(l), F.S. (2017)

²⁰ Section 1011.62(1)(m), F.S. (2017)

²¹ Section 1011.62(1)(n), F.S. (2017)

certification earned, a school district receives bonus funding of 0.1, 0.2, 0.3, 0.5, or 1.0 FTE.²² Teacher bonus funding is awarded for each student taught by a teacher who provided instruction in a course that led to the student’s attainment of a CAPE industry certification on the CAPE Industry Certification Funding List, as follows:

- A bonus in the amount of \$25 is awarded for a course with a weight of 0.1.²³
- A bonus in the amount of \$50 is awarded for a course with a weight of 0.2.²⁴
- A bonus in the amount of \$75 is awarded for a course with a weight of 0.3.²⁵
- A bonus in the amount of \$100 is awarded for a course with a weight of 0.5 or 1.0.²⁶

Yearly Teacher per-Student CAPE Bonuses		
Weight	Type	Amount
0.1 FTE	CAPE Industry Cert Does Not Articulate	\$25
0.2 FTE	CAPE Industry Cert Articulates to College Credit	\$50
0.3 FTE	CAPE Innovation Course ²⁷	\$75
0.5 FTE	CAPE Acceleration Industry Cert Articulates to 15-29 College Credit Hours ²⁸	\$100
1.0 FTE	CAPE Acceleration Industry Cert Articulates to 30+ College Credit Hours	\$100

Effect of Proposed Changes

The bill defines the term “computer science” to mean the study of computers and algorithmic processes, including their principles, hardware and software designs, applications, and their impact on society. The bill specifies that “computer science” includes computer coding and computer programming.

The bill specifies that opportunities for computer science instruction must include courses in computer science in both middle school and high school. Under the bill, computer science courses must be integrated into each school district’s middle and high schools, including combination schools in which any of grades 6 through 12 are taught.

The bill requires the Florida Department of Education (DOE) to identify computer science courses in the Course Code Directory that count toward the percentage thresholds. The DOE must identify the courses on its website no later than July 1, 2018.

²² Section 1011.62(1)(o), F.S. (2017)

²³ *Id.*

²⁴ *Id.*

²⁵ *Id.*

²⁶ *Id.*

²⁷ A CAPE Innovation course is one of up to five courses annually approved by the Commissioner of Education that combines academic career content and incorporates at least two third-party assessments that, if completed successfully by the student, articulate to college credit. *See* s. 1003.4203(5)(a), F.S. For a list of approved courses, *see* Florida Department of Education, *CAPE Innovation Courses*, <http://www.fldoe.org/academics/career-adult-edu/cape-secondary/innovation.stml> (last visited Aug. 24, 2017).

²⁸ A CAPE Acceleration industry certification is one annually approved by the Commissioner of Education that articulates to 15 or more college credits. *See* s. 1011.62(5)(b), F.S.

The bill requires the Florida Virtual School (FLVS) to offer computer science courses identified by the DOE. If a school district does not offer an identified course, the district must provide students access to the course through the FLVS or through other means.

To encourage educators to earn credentials for teaching computer science, the bill establishes a bonus program, subject to appropriation. Under the program, a classroom teacher who is rated highly effective or effective pursuant to his or her evaluation in the previous school year, or who is newly hired but has not received an evaluation, must receive a bonus as follows:

- If the teacher holds an educator certificate in computer science or if he or she has passed the computer science subject area test and holds an adjunct certificate issued by the school district, the teacher will receive a bonus of \$1,000 after each year he or she completes teaching a computer science course identified by the DOE at a public middle, high, or combination school in the state, for up to 3 years.
- If the teacher holds an industry certification associated with a course identified by the DOE, the teacher will receive a bonus of \$500 after each year the individual completes teaching the identified course at a public middle, high, or combination school in the state, for up to 3 years.

A school district must report a qualifying classroom teacher to the DOE by a date and in a format established by the DOE. The bill specifies that an eligible classroom teacher will receive his or her bonus upon completion of the school year in which he or she taught the course but may not receive more than one bonus per year under the program.

Bonus funds under the program would be in addition to existing bonuses provided through the FEFP for teachers whose students who pass exams that lead to college credit (AP, IB, and AICE) or the attainment of an industry certification.

To help teachers earn a qualifying credential under the bonus program, the bill provides that, subject to appropriation, a school district or a consortium of school districts may apply to the DOE for funding to deliver or facilitate training for classroom teachers to earn an educator certificate in computer science or an industry certification associated with an identified course. The bill specifies that the funding may only be used to provide training for classroom teachers and to pay fees for examinations that lead to a qualifying credential.

B. SECTION DIRECTORY:

Section 1. Amends s. 1007.2616, F.S.; providing a definition; providing requirements for specified instruction relating to computer science; requiring certain computer science courses to be included in the Course Code Directory and published on the Department of Education's website by a specified date; requiring the Florida Virtual School to offer certain computer science courses; requiring school districts to provide access to computer science courses offered by the Florida Virtual school or by other means under certain circumstances; developing mechanism for classroom teachers to earn an educator certificate in computer science; requiring high school students to be provided opportunities to take certain courses to certain meet graduation requirements; establishing bonuses for certain classroom teachers; and requiring, rather than authorizing, the State Board of Education to adopt rules.

Section 2. Provides that the bill takes effect upon becoming a law.

II. FISCAL ANALYSIS & ECONOMIC IMPACT STATEMENT

A. FISCAL IMPACT ON STATE GOVERNMENT:

1. Revenues:

None.

2. Expenditures:

See Fiscal Comments, *infra*.

B. FISCAL IMPACT ON LOCAL GOVERNMENTS:

1. Revenues:

None.

2. Expenditures:

None.

C. DIRECT ECONOMIC IMPACT ON PRIVATE SECTOR:

None.

D. FISCAL COMMENTS:

Funding for the teacher training grant program and teacher bonus program are subject to an appropriation.

III. COMMENTS

A. CONSTITUTIONAL ISSUES:

1. Applicability of Municipality/County Mandates Provision:

None.

2. Other:

None.

B. RULE-MAKING AUTHORITY:

The bill requires the State Board of Education to adopt rules to implement the provisions of the bill and other requirements related to computer science instruction under s. 1007.2616, F.S.

C. DRAFTING ISSUES OR OTHER COMMENTS:

None.

IV. AMENDMENTS/ COMMITTEE SUBSTITUTE CHANGES

On February 13, 2018, the PreK-12 Appropriations Subcommittee adopted two amendments and reported the bill favorably as a committee substitute.

- The first amendment removes the requirement that school districts must offer computer science courses identified by the Department of Education so that at least 10 percent of a school district's

middle schools, high schools, and combination schools with grades 6th-12th were offering at least one computer science course by the 2020-2021 school year.

- The second amendment removes the needs-based technology grant for school districts whose Digital Classroom Allocation funds are insufficient to meet costs associated with the requirements of this bill.

The analysis is drafted to the bill as amended by the PreK-12 Appropriations Subcommittee.