The Florida Senate

BILL ANALYSIS AND FISCAL IMPACT STATEMENT

(This document is based on the provisions contained in the legislation as of the latest date listed below.)

Prepared By: The Professional Staff of the Committee on Education

BILL:	SB 790
INTRODUCER:	Senator Hooper
SUBJECT:	Computer Science and Technology Instruction
DATE:	November 29, 2021 REVISED:

	ANALYST	STAFF DIRECTOR	REFERENCE	ACTION
1.	Sagues	Bouck	ED	**Pre-meeting**
2.			AED	
3.			AP	

I. Summary:

SB 790 repeals s. 1007.2616, F.S., relating to computer science and technology instruction, and moves the content, with modifications, to a newly created s. 1003.4202, F.S. also relating to computer science and technology instruction, and modifies s. 1003.01, F.S. relating to definitions. Specifically, the bill:

- Defines computer science and computational thinking.
- Clarifies the intent of elementary and middle school computer science instruction as providing a foundation for future computer usage and achieving digital literacy.
- Expands the personnel authorized to participate in computer science training and professional development programs to include not only classroom teachers but also instructional personnel, which includes school counselors, social workers, school psychologists, and librarians and media specialists.
- Establishes criteria for the award of funds for computer science training and professional development program to require the Florida Department of Education (DOE) to award funding in an equitable manner that accounts for the unique needs of small and rural school districts.
- Requires the DOE to prepare and submit a report by each December 1 to the Governor, Cabinet, and the Legislature which details the funding formula and distribution of funds to each school district.
- Expands the personnel who may receive the $1,000 and $500 bonuses established in law related to computer science instruction to include instructional personnel at elementary and secondary schools who are evaluated as effective or highly effect in the previous school year or instructional personnel who were newly hired by the district school board and have not been evaluated. Requires a school district to include instructional personnel in the required report to the DOE identifying those qualifying for a bonus.

The bill authorizes that any such funds allocated which are not disbursed by June 30 of the fiscal year in which the funds are allocated may be carried forward for up to 5 years after the effective date of the original appropriation.

The bill also authorizes the State Board of Education to adopt rules to implement provisions in the bill.

The fiscal impact of the bill is indeterminate. See Section V.

The bill takes effect on July 1, 2022.

II. Present Situation:

Computer Science

The influence of computing is felt daily and experienced on a personal, societal, and global level.[1] Computer science, the discipline that makes the use of computers possible, has driven innovation in every industry and field of study and is powering approaches to many of the world's challenges.[2] Computer knowledge and skills are increasingly being recognized as foundational for an educated citizenry as computer science is considered a central component of innovation, economic growth and employment.[3]

Computer science is also foundational for student success. Multiple studies have shown that students who study computer science perform better in other subjects, excel at problem-solving, and are 17 percent more likely to attend college.[4] Although 90 percent of parents want their child to study computer science, only 47 percent of high schools teach computer science.[5]

Computer Science Courses and Instruction

Florida law defines computer science as the study of computers and algorithmic processes, including their principles, hardware and software designs, applications, and their impact on society.[6] Computer science also includes computer coding and computer programming.[7]

Foundational skills for computer science learning include problem solving, such as computational thinking, understanding and recognizing patterns, understanding and

[1] K12 Computer Science, *K12 Computer Science Framework* (2016), available at https://k12cs.org/wp-content/uploads/2016/09/K%E2%80%9312-Computer-Science-Framework.pdf at 1.
[2] Examples of challenges include decreasing automobile deaths, distributing medical vaccines, and providing platforms for rural villagers to participate in larger economies. *Id.*
[3] Education Commission of the States, *State-level Policies Supporting Equitable K-12 Computer Science Education* (2017), available at https://www.ecs.org/wp-content/uploads/MassCAN-Full-Report-v10.pdf at 7.
[4] Code.org, *Why Computer Science*, https://code.org/promote (last visited Nov. 18, 2021). Code.org, *More Data and Talking Points for Advocacy, Why study computer science*, https://code.org/promote/morestats (last visited Nov. 19, 2021).
[5] *Id.*
[6] Section 1007.2616(1), F.S.
[7] *Id.*

implementing sequencing, and understanding representation, meaning how computers represent data.[8]

Computational thinking, which refers to the thought processes involved in expressing solutions as computational steps or algorithms that can be carried out by a computer,[9] is essentially a problem-solving process that designs solutions that capitalize on the power of computers.[10] Although typically associated with computer science, computational thinking can also be applied in the classroom setting through lessons in core subject areas.[11]

Florida public schools are required to provide students in grades K-12 opportunities for learning computer science including computer coding and computer programming.[12] Such opportunities may include:[13]

- Instruction on computer coding in elementary and middle school; and
- Instruction to develop computer usage and digital literacy[14] skills in middle school.

Elementary and middle schools may establish digital classrooms in which students are provided opportunities to improve digital literacy and competency; to learn digital skills, such a coding, multiple media presentation, and the manipulation of multiple digital graphic images. Students may also have the opportunity to earn digital tool certificates and certifications.[15]

Computer science courses must be offered to students in middle school and high school, including opportunities to earn industry certifications related to the courses.[16] Computer science courses and technology-related industry certifications that are identified as meeting mathematics or science requirements for high school graduation must be included in the Course Code Directory.[17]

The Florida Virtual School (FLVS) must offer computer science courses identified in the Course Code Directory. If a school district does not offer an identified course, the district must provide students access to the course through FLVS or through other means.[18]

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[8] K-12 Computer Instruction Framework Steering Committee, *K-12 Computer Instructional Framework* (2016), pgs. 183-198, available at https://k12cs.org/wp-content/uploads/2016/09/K%E2%80%9312-Computer-Science-Framework.pdf.
[9] *Id*. at 295.
[10] *Id* at 69.
[11] For example, in English language arts, students may be asked to analyze simple sentences and determine a framework for generating similar sentences, using pattern recognition and problem solving skills.Code.org, *Computational Thinking Lesson Assessment*, available at https://code.org/curriculum/course3/1/Assessment1-CompThinking.pdf.
[12] Section 1007.2616(2)(a), F.S.
[13] *Id*.
[14] Digital literacy is the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills. American Library Association, *Digital Literacy*, https://literacy.ala.org/digital-literacy/ (last visited Nov. 19, 2021).
[15] Section 1007.2616(5), F.S. *See* Section 1003.4203, F.S.
[16] *Id*.
[17] Section 1007.2616(6), F.S.
[18] Section 1007.2616(3), F.S.

There are 66 middle and high school, as well as 2 elementary school, computer science courses currently identified in the Course Code Directory.[19]

High School Graduation Requirements

In Florida, a student must successfully complete 24 credits specified in law, an International Baccalaureate curriculum, or an Advanced International Certificate of Education curriculum to earn a standard high school diploma.[20] The required credits may be earned through equivalent, applied, or integrated courses or career education courses, including work-related internships approved by the SBE and identified in the course code directory. However, any must-pass assessment requirements must be met.[21] A student may also earn a standard high school diploma through the 18 credit Academically Challenging Curriculum to Enhance Learning Option (ACCEL)[22] or the Career and Technical Education Graduation Pathway Option.[23] Both 18 credit options also require students to meet English language arts, mathematics, science, and social studies credit and assessment requirements.[24]

To graduate, a student must complete the specified requirements, including 4 credits in mathematics and 3 credits in science, and earn a cumulative grade point average (GPA) of 2.0 or higher on a 4.0 scale.[25] A student must also pass the statewide, standardized grade 10 ELA FSA and the statewide, standardized Algebra I End-of-Course (EOC) assessment.[26]

A student who earns a computer science credit may substitute the credit for up to 1 credit of the mathematics requirement with the exception of Algebra I and Geometry, or up to 1 credit of the science requirement, with the exception of Biology I.[27]

Students may also satisfy mathematics and science graduation requirements through specified industry certifications, as follows:[28]

- A student who earns an industry certification for which there is a statewide college credit articulation agreement approved by the State Board of Education may substitute the certification for one mathematics credit, except for Algebra I and Geometry, up to two credits.
- A student who earns an industry certification in 3D rapid prototype printing may satisfy up to two credits of the mathematics requirement, with the exception of Algebra I, if the

[19] Florida Department of Education, *Florida Course Code Directory Computer Science Course Information 2020-2021* (2020), *available at* http://www.fldoe.org/core/fileparse.php/7746/urlt/2021CompSci.pdf (last visited Mar. 9, 2021).
[20] Section 1003.4282(1)(a), F.S.
[21] *Id*. at (1)(b). An equivalent course is one or more courses identified by content-area experts as being a match to the core curricular content of another course, based upon review of the Next Generation Sunshine State Standards for that subject. An applied course aligns with Next Generation Sunshine State Standards and includes real-world applications of a career and technical education standard used in business or industry. An integrated course includes content from several courses within a content area or across content areas.
[22] Section 1002.3105, F.S.
[23] Section 1003.4282(11), F.S.
[24] *Id.* and Section 1002.3105 F.S.
[25] Section 1003.4282(6)(a), F.S.
[26] Section 1003.4282(3), F.S.
[27] *Id*.
[28] Section 1003.4282(3)(b) and (c), F.S.

commissioner identifies the certification as being equivalent in rigor to the mathematics credit or credits.
- A student who earns an industry certification for which there is a statewide college credit articulation agreement approved by the State Board of Education may substitute the certification for one science credit, except for Biology I.

Evaluation of Instructional Personnel

Florida law requires each district school superintendent to establish procedures to evaluate the job performance of district instructional personnel.[29] The DOE must approve each school district's performance evaluation system, which must, among other requirements[30], differentiate among the following four levels of performance: [31]
- Highly Effective.
- Effective.
- Needs Improvements or, for instructional personnel in the first 3 years of employment who needs improvement, Developing.
- Unsatisfactory.

Instructional personnel must be evaluated annually,[32] except that newly hired classroom teachers must be evaluated at least twice in their first year of teaching in the school district.[33] Newly hired classroom teachers include first-time teachers new to the profession as well as veteran teachers new to the school district.[34]

Computer Science Teacher Training

Subject to an appropriation, a school district may apply to the DOE for funding to deliver or facilitate training for classroom teachers to earn an educator certificate in computer science or training that leads to an industry certification associated with a course identified in the Course Code Directory, or for professional development for classroom teachers to provide instruction in computer science courses and content.[35]

Also subject to an appropriation, a classroom teacher who was evaluated as effective or highly effective in the previous school year or who is newly hired by the district school board and has not been evaluated must receive a bonus if the classroom teacher holds an:[36]
- Educator certificate in computer science or if he or she has passed the computer science subject area examination and holds and adjunct certificate issued by a school district, he or

[29] Section 1012.34(1)(a), F.S.
[30] *See* Section 1012.34(2), F.S.
[31] Section 1012.34(1)(b), (2), and (3)(a), F.S. *See* Rule 6A-5.030, F.A.C.
[32] The DOE suspended the requirement to conduct annual evaluations for teachers and administrators for the 2019-2020 school year in response to COVID-19. Florida Department of Education, Order No. 2020-EO-02 (May 13, 2020), at 5, *available at* https://www.fldoe.org/core/fileparse.php/19861/urlt/DOEEmergencyOrder2020-EO-02.pdf.
[33] Section 1012.334(3)(a), F.S.
[34] Rule 6A-5.030(2)(g), F.A.C.
[35] Section 1007.2616(4), F.S.
[36] Section 1007.2614(7), F.S.

she must receive a $1,000 bonus after each year the individual completes teaching a computer science course at a public middle or high school, for up to 3 years.
- Industry certification associated with a computer science course, he or she must receive a bonus of $500 after each year the individual completes teaching the identified course at a public middle or high school, for up to 3 years.

The appropriation to fund training for computer science and teacher bonuses for fiscal year 2021-2022 is $10 million.[37]

III. Effect of Proposed Changes:

SB 790 repeals s. 1007.2616, F.S., relating to computer science and technology instruction, and moves the content, with modifications, to a newly created s. 1003.4202, F.S., also relating to computer science and technology instruction, and modifies s. 1003.01, F.S. relating to definitions. Specifically, in the area of computer science courses and instruction, the bill:
- Defines computer science and computational thinking.[38]
- Maintains the authorization for each elementary school, and the requirement for each middle school, to provide computer science instruction, but clarifies the intent of such instruction as providing a foundation for future computer usage and achieving digital literacy.
- Maintains a requirement that school districts provide access to computer science courses offered through the Florida Virtual School if the school district does not offer an identified course, but requires that if a district uses another means to provide instruction, it must be approved by the Florida Department of Education (DOE).

The bill also includes provisions relating to computer science teacher training. Subject to legislative appropriation, the bill:
- Maintains the authorization for school districts to establish computer science training and professional development programs, but expands the personnel authorized to participate in such programs to include not only classroom teachers but also instructional personnel,[39] which includes school counselors, social workers, school psychologists, and librarians and media specialists.
- Establishes criteria for the award of funds for computer science training and professional development programs to require the DOE to award funding in an equitable manner that accounts for the unique needs of small and rural school districts.
- Requires the DOE to prepare and submit a report by each December 1 to the Governor, Cabinet, and the Legislature which details the funding formula and distribution of funds to each school district.
- Expands the personnel who may receive the $1,000 and $500 bonuses established in law related to computer science instruction to include instructional personnel at elementary and secondary schools who are evaluated as effective or highly effect in the previous school year,

[37] Section 2, ch. 2021-36, L.O.F.
[38] The bill largely maintains the definition of "computer science" as the study of computers and algorithmic processes, including their principles, hardware and software design, applications, and impact on society, and includes computer coding, computer programming, but adds to the definition the implementation of processes and includes computational thinking, robotics, and physical computing. The bill also adds a new definition of "computational thinking" defined as the thought process involved in expressing solutions as computational steps or algorithms that can be carried out by a computer.
[39] The bill defines "instructional personnel" as those identified in section 1012.01(a), (b), and (c), F.S.

or instructional personnel who were newly hired by the district school board and have not been evaluated. Requires a school district to include instructional personnel in the required report to the DOE identifying those qualifying for a bonus.

- Maintains that qualified instructional personnel must receive a bonus upon completion of the school year in which the course was taught, but limits instructional personnel from receiving more than one bonus per year.

The bill authorizes that any such funds allocated which are not disbursed by June 30 of the fiscal year in which the funds are allocated may be carried forward for up to 5 years after the effective date of the original appropriation.

The bill also authorizes the State Board of Education (SBE) to adopt rules to implement provisions in the bill. Since some provisions of the bill are similar to provisions in s. 1007.2616, F.S., which is repealed in the bill, the SBE may need to modify some provisions already adopted in rule.

Providing opportunities for students to learn computer science in kindergarten through grade 12, along with providing instructional personnel the training and resources to be successful, may increase interest for instructional personnel to teach computer science, allow more students to be exposed to and learn computer science, and may ultimately lead to more students following a computer science-related career path.

IV. Constitutional Issues:

A. Municipality/County Mandates Restrictions:

None.

B. Public Records/Open Meetings Issues:

None.

C. Trust Funds Restrictions:

None.

D. State Tax or Fee Increases:

None.

E. Other Constitutional Issues:

None.

V. Fiscal Impact Statement:

A. Tax/Fee Issues:

None.

B. Private Sector Impact:

None.

C. Government Sector Impact:

The fiscal impact of the bill is dependent on a legislative appropriation and therefore indeterminate. The appropriation to fund similar provisions pursuant to s. 1007.2616, F.S., is $10 million for fiscal year 2021-2022.[40]

VI. Technical Deficiencies:

None.

VII. Related Issues:

None.

VIII. Statutes Affected:

This bill substantially amends section 1003.01 of the Florida Statutes.
This bill creates section 1003.4202 of the Florida Statutes.
This bill repeals section 1007.2616 of the Florida Statutes.

IX. Additional Information:

A. Committee Substitute – Statement of Changes:
(Summarizing differences between the Committee Substitute and the prior version of the bill.)

None.

B. Amendments:

None.

[40] Section 2, ch. 2021-36, L.O.F.