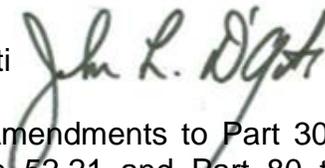




TO: Higher Education Committee

FROM: John D'Agati 

SUBJECT: Proposed Amendments to Part 30 of the Regents Rules and Section 52.21 and Part 80 the Regulations of the Commissioner of Education Relating to a New Certification Area and Tenure Area for Computer Science

DATE: December 7, 2017

AUTHORIZATION(S):  

SUMMARY

Issue for Discussion

Should the Board of Regents adopt proposed amendments to Part 30 of the Regents Rules and §52.21 and Part 80 of the Regulations of the Commissioner of Education related to the creation of a new certification area and tenure area in the classroom teaching service for computer science?

Reason(s) for Consideration

Review of Policy.

Proposed Handling

The proposed amendment is submitted to the Higher Education Committee for discussion at its December 2017 Board of Regents meeting (Attachment A is a copy of the proposed amendment).

Procedural History

A Notice of Proposed Rule Making will be published in the State Register on November 29, 2017. Supporting materials for the proposed amendment are available upon request from the Secretary to the Board of Regents.

Background Information

In April 2017, the Board was presented with information about the creation of a computer science certificate (see Related Regents Items). Currently, there is no computer science certificate in New York, and therefore there are no undergraduate or graduate computer science education preparation programs in New York State institutions of higher education. Stakeholders from the field have approached the Department to discuss the need for a computer science certificate.

Rationale for a Computer Science Certificate

Computers are an integral part of our daily lives, influencing how we connect with the world and function within it. Computer science courses in schools provide students with the opportunity to learn how computers work and how we can use computers to solve problems in our society. The foundational knowledge in these courses is critical to preparing each child for success in college, career, and citizenship for the 21st century.

There is a growing movement at the state and national levels for students to learn about computer science in schools. In New York City, the goal of the “Computer Science for All” initiative is that all public school students will engage in computer science education at the elementary, middle, and high school levels by 2025. The Association for Computing Machinery, Code.org, Computer Science Teachers Association (CSTA), Cyber Innovation Center, and National Math and Science Initiative collaborated with states, school districts, technology companies, and other organizations in the development of a [K-12 Computer Science Framework \(2016\)](#) that describes the computer science concepts and practices in which students should engage through elementary, middle, and high school. In addition, almost all parents (93%) support the use of school resources to provide computer science education at their child’s school ([Google & Gallup, 2016](#)).

Learning computer science concepts and practices develops computational skills, logic, problem solving, and creativity. This set of skills is important for citizenship and for any career in today’s world. Jobs in computing are particularly high-paying and in high-demand. According to [Code.org](#), there are currently 486,686 openings for computing jobs while only 42,969 computer science students graduated into the workforce last year. The [Bureau of Labor Statistics](#) also projects that two of the top 15 fastest growing jobs from 2016-2026 will be computing jobs: software developers/applications (30.5% expected growth rate) and information security analysts (28.4% expected growth rate).

The College Board offers two Advanced Placement (AP) exams where high school students can demonstrate their understanding of computer science and earn college credit: AP Computer Science A and AP Computer Science Principles. The latter test was launched this year. [Code.org](#) found that the number of AP computer science test takers more than doubled from last year to 111,262 test takers in 2017. However, only 20% of the test takers were students of color and 27% of the test takers were female. These percentages highlight the need to provide each student with access to

computer science education throughout their schooling, enabling them to learn important knowledge and skills to help close equity gaps in achievement and employment.

The Department is recommending the development of a computer science certificate that spans all grades in response to the growing need and desire to prepare students to succeed in a world with constantly evolving computer technologies. A computer science certificate in the classroom teaching service would ensure that students are working with teachers who have the knowledge and skills to provide high-quality computer science instruction and would establish minimum and consistent standards for teachers of computer science courses.

Definition of Computer Science

The Association for Computing Machinery Model Curriculum for K-12 Computer Science (Tucker, 2006) defines computer science as “the study of computers and algorithmic processes including their principles, their hardware and software design, their applications, and their impact on society” (page 2). Computer science is not the same as other areas of computing, such as computer literacy and digital citizenship. For example, computer literacy and digital citizenship focus on how to use computer technologies while computer science focuses on how computers work and how to create those technologies.

Computer science is an academic discipline that is more than only programming. The [K-12 Computer Science Framework \(2016\)](#) recommends that students learn about the following five computer science concepts: 1) algorithms and programming, 2) computing systems, 3) data and analysis, 4) impacts of computing, and 5) networks and the internet. Through these concepts, students would engage in a variety of activities including creating prototypes that use algorithms to solve computational programs; comparing interactions between application software, system software, and hardware layers; refining computational models based on data; evaluating the ways that computing impacts social and economic practices; and comparing various security measures of a computing system. These types of activities immerse students in creative problem solving where they learn how to identify and present problems that computers can solve and how computers can solve them.

Computer science courses, such as AP Computer Science, address the above concepts. The proposed computer science certificate does not prevent teachers who hold other certificates from teaching aspects of these concepts in other subject area courses and in elementary schools. In addition, career and technology education (CTE) teachers will continue to be able to teach computer-related and technology courses in CTE programs.

Distinction Between the Proposed Computer Science Certificate and Existing Certificates

Conversations with educational stakeholders reveal that some confusion still exists between a computer science certificate and the existing technology education

and educational technology specialist certificates. Below is a brief description of these two certificates.

A **Technology Education** certificate allows an educator to teach courses that use concepts of science, mathematics, social science, and language arts in a hands-on, systems-based approach to problem solving that guides students in the understanding, design, and development of systems, devices, and products to serve human needs and wants.

An **Educational Technology Specialist** certificate allows an educator to be equipped to integrate technology into the classroom to enhance instruction and improve student achievement. These educators do not teach computer science or technology education courses. Rather, they mentor K-12 teachers to help them learn to use and integrate technology into the classroom, design technology-infused curriculum, and implement classroom projects in which technology is well-integrated.

Neither of these certificates directly address the knowledge and skills needed to effectively deliver instruction to students in Kindergarten through grade 12 in all facets of computer science.

There is also a Career and Technology Education (CTE) certificate title in Computer Technology. CTE certificate holders teach courses in approved CTE programs. There are several computer science courses that are electives for students outside of CTE programs, such as AP Computer Science.

Transition and Implementation of the Computer Science Certificate

Currently, teachers who hold a certificate in any area are teaching computer science courses. The proposed amendment outlines a process for “grandfathering” those teachers currently teaching computer science courses, as well as those who begin teaching computer science courses between now and September 1, 2022. This process will allow those teaching computer science courses in school districts and BOCES to continue doing so without holding a computer science certificate for 10 years from the date the statement of continued eligibility is issued. Having these teachers continue to teach computer science courses provides time for institutions of higher education to implement computer science teacher preparation programs and additional time for these individuals teaching such courses to obtain computer science certification. This process also helps to ensure flexibility during this time of transition for school districts and BOCES.

Creating a new certificate, and therefore a new tenure area, will impact those currently teaching and those entering the profession with a computer science certificate. In response, the proposed amendment adds computer science as a “special subject” tenure area. After September 1, 2022, an educator who was previously appointed tenure in a different tenure area may choose to continue to receive credit toward tenure and seniority rights in their previous tenure area while devoting a substantial portion of their time to teaching computer science courses, or they may choose to change their tenure area to receive credit and accrue seniority rights in the special subject tenure area of computer science. By giving educators a choice, they will be able to make an

informed decision as to the accrual of their tenure and seniority rights based on their teaching assignments.

For educators assigned/appointed on or after September 1, 2022 who are devoting a substantial portion (40% or more) of their time teaching computer science, probationary appointments and appointments in tenure will be made in accordance with normal tenure rules. Specifically, these teachers must be appointed tenure in the special subject tenure area (computer science).

Proposed Amendment

At this time, the Department is proposing amendments to Parts 30, 52, and 80 to create a computer science certificate for all grades (P-12) and program registration requirements for computer science education programs. The computer science education programs would enable candidates to obtain an initial certificate in computer science. To allow colleges time to prepare for and develop computer science programs, the proposed amendments will allow certified educators who are currently teaching computer science courses to continue teaching these courses without holding a computer science certificate while holding a statement of continued eligibility.

The amendments also make changes to Part 30 which relates to tenure areas. Computer science will be considered a “special subject” across all grades. The proposed amendment provides flexibility and allows certain candidates who teach a substantial portion of their time in computer science courses to choose to either continue accruing tenure in their base certificate or in the special subject computer science area.

Pathways to a Computer Science Certificate:

Overall, the proposed amendments create four pathways for an individual to pursue an initial certificate in computer science:

1. Approved program pathway: an individual pursuing a bachelor’s degree in an educator preparation program leading to an initial certificate in computer science or a master’s degree in an educator preparation program leading to an initial computer science certificate.
2. Individual evaluation pathway: an individual with a bachelor’s degree or higher and at least 12 semester hours of coursework in computer science may pursue this pathway upon meeting pedagogy and student teaching requirements.
3. Industry experience: individuals who already have a bachelor’s degree or higher and also have had three or more years of experience working in a position that requires the skills of a computer scientist may pursue this pathway and would need to complete specific pedagogical coursework.
4. Additional certificate pathway: individuals who already hold a teaching certificate may pursue an additional certificate in computer science by meeting specific computer science coursework.

Currently, there is no content specialty test (CST) for computer science. However, at such time as one becomes available, the Department will require those pursuing an initial certificate in computer science to take and pass the exam.

Related Regents Items

April 2017 Item and Presentation:

<http://www.regents.nysed.gov/common/regents/files/417hed1.pdf>

<http://www.regents.nysed.gov/common/regents/files/HE%20-%20The%20Future%20is%20Now%20-%20Preparing%20Highly%20Qualified%20Computer%20Science%20Teachers%20for%20All.pdf>

Recommendation

Not Applicable.

Timetable for Implementation

Following the 45-day public comment period required under the State Administrative Procedure Act, it is anticipated that the proposed amendment will be presented to the Board of Regents for adoption at its March 2018 meeting. If adopted at the March 2018 meeting, the proposed amendment will become effective on March 29, 2018.

AMENDMENT TO THE RULES OF THE BOARD OF REGENTS AND THE REGULATIONS OF THE COMMISSIONER OF EDUCATION

Pursuant to Education Law sections 101, 207, 210, 215, 305, 3001, 3004 and 3009.

1. Subdivisions (d) and (e) of Section 30-1.2 of the Rules of the Board of Regents shall be renumbered as subdivisions (e) and (f) and the renumbered subdivision (e) shall be amended to read as follows:

(e) Except as otherwise provided in subdivisions (b) [and], (c) and (d) of this section, each board of education or board of cooperative educational services shall on and after the effective date of this Subpart make probationary appointments and appointments on tenure in accordance with the provisions of this Subpart.

2. A new subdivision (d) shall be added to section 30-1.2 of the Rules of the Board of Regents to read as follows:

(d) The provisions of this Subpart shall apply to a professional educator employed by a school district or board of cooperative educational services to devote a substantial portion of his or her time to the provision of instruction in computer science, on or after August 1, 1975, as follows:

(1) A professional educator employed by a school district or board of cooperative educational services on September 1, 2022 who was previously appointed by the board to tenure or a probationary period in a tenure area identified in this Subpart shall either:

(i) continue to receive credit toward tenure and/or accrue tenure and seniority rights in his or her previous tenure area from the initial date of his or her assignment and continue to receive tenure and/or seniority rights in his or her previous tenure area while assigned to devote a substantial portion of his or her time to the provision of instruction in computer science; or

(ii) if the professional educator provides knowing consent to the school district or board of cooperative educational services to change his or her tenure area pursuant to section 30-1.9 of this Subpart by September 1, 2022, he or she may receive credit toward tenure and/or accrue tenure and seniority rights in the special subject tenure area of computer science, established in section 30-1.8 of this Subpart, from the date of his or her initial assignment to a position where he or she devoted a substantial portion of his or her time to the provision of instruction in computer science and he or she shall continue to receive tenure and seniority rights in that tenure area while assigned to a position where he or she devotes a substantial portion of his or her time to the provision of computer science instruction appropriate for such tenure area.

(2) Any school district or board of cooperative educational services that appoints or assigns a professional educator on or after September 1, 2022 to devote a substantial portion of his or her time to the provision of computer science instruction shall make probationary appointments and appointments on tenure in accordance with section 30-1.8(e) of this Subpart.

(3) Any board of cooperative educational services that appoints a professional educator on or after September 1, 2022 to devote a substantial portion of his or her time to computer science instruction as a result of a board of cooperative educational services taking over a program formerly operated by a school district or a county vocational education and extension board pursuant to section 3014-a of the Education Law, shall credit the professional educator with tenure and seniority rights in the special subject tenure area for computer science instruction established in section 30-1.8(e) of this Subpart from the initial date of his or her assignment to the performance of computer science instruction in the school district or county vocational education and extension board and shall continue to credit the professional educator with tenure

and/or seniority rights in such tenure area while he or she is assigned to devote a substantial portion of his or her time to the performance of computer science instruction in such tenure area at the board of cooperative educational services.

(4) Any board of education that appoints a professional educator on or after September 1, 2022 to devote a substantial portion of his or her time to computer science instruction as a result of a school district taking over a program formerly operated by a board of cooperative educational services pursuant to section 3014-b of the Education Law, where the professional educator is serving in a computer science instruction tenure area pursuant to section 30-1.9(b) of this Subpart, shall credit the professional educator with tenure and seniority rights in a tenure area for which he or she holds the proper certification as described in section 30-1.9(b) of this Subpart, from the initial date of his or her assignment to the performance of computer science instruction in the board of cooperative educational services and shall continue to credit such professional educator with tenure and/or seniority rights in such tenure area while he or she is assigned to devote a substantial portion of his or her time to the performance of computer science instruction provided that he or she holds the proper certification for such tenure area.

3. Paragraphs (14) through (16) of subdivision (a) of section 30-1.8 of the Rules of the Board of Regents shall be amended to read as follows:

(14) speech—remedial; [and]

(15) English as a second language[.]; and

(16) Computer science.

4. Subdivision (d) in section 30-1.9 of the Rules of the Board of Regents, is amended to read as follows:

(d) If a professional educator possesses certification appropriate to more than a single tenure area and the board of education or board of cooperative educational services proposes at the time of initial appointment to assign such individual in such a manner that he will devote a substantial portion of his time during each of the school years constituting the probationary period in more than one of the tenure areas established by this Subpart, the board shall in its resolution of appointment designate such tenure area and shall thereafter separately confer or deny tenure to such individual in the manner prescribed by statute in each designated tenure area, except that individuals accruing tenure and/or seniority rights in their previous tenure area for the performance of duties in instructional support services or computer science as provided for in [section] sections 30-1.2(c)(1)(i) and (d)(1)(i) of this Subpart as applicable, shall only accrue tenure and/or seniority rights in their previous tenure area and not in one of the instructional support services tenure areas or the computer science tenure area [prescribed] described in section 30-1.8(a) and (e) of this Subpart as applicable.

5. Subparagraph (v) of paragraph (3) of subdivision (b) of section 52.21 of the Regulations of the Commissioner of Education shall be amended to read as follows:

(v) Programs leading to initial certificates valid for teaching a special subject (all grades).

(a) Content core. [In] Except as provided in paragraph (1) of this subdivision, in addition to meeting the general requirements for the content core prescribed in clause (2)(ii)(b) of this subdivision, the content core shall be a major or its equivalent in the subject area of the certificate that provides a knowledge base for assisting students in meeting the State learning standards for students, as applicable to one of the following subjects and prescribed in Part 100 of this Title: dance, family and consumer sciences,

health education, music, physical education, technology education, theatre, or visual arts.

(1) For certificates in computer science (all grades), in addition to meeting the general requirements for the content core prescribed in clause (2)(ii)(b) of this subdivision and until such time as the Department adopts State learning standards for computer science in Part 100 of this Title, the content core shall be at least a total of 12 semester hours that provides a knowledge base for assisting students in understanding the following concepts

(i) Algorithms and programming;

(ii) Computing systems;

(iii) Data and analysis;

(iv) Impacts of computing; and

(v) Networks and the internet.

6. Subparagraphs (xxvi) through (xlvi) of paragraph (1) of subdivision (e) of section 80-3.2 of the Regulations of the Commissioner of Education shall be renumbered subparagraphs (xxvii) through (xlvi) of section 80-3.2 of the Regulations of the Commissioner of Education and a new subdivision (xxvi) shall be added to read as follows:

(xxvi) Computer science, all grades.

7. Subdivision (b) of section 80-3.3 of the Regulations of the Commissioner of Education shall be amended to read as follows:

(b) Requirements for initial certificates in all titles in classroom teaching service, except in a specific career and technical subject within the field of agriculture, business and marketing, family and consumer sciences, health, a technical area or a trade

(grades 7 through 12). The candidate shall meet the requirements in each of the following paragraphs:

(1) . . .

(2) Examination. The candidate shall meet the examination requirement by meeting the requirements in one of the following subparagraphs:

(i)

(a) Except as otherwise provided in this section, for candidates applying for certification on or after May 1, 2014 or candidates who applied for certification on or before April 30, 2014 but did not meet all the requirements for an initial certificate on or before April 30, 2014, such candidates shall submit evidence of having achieved a satisfactory level of performance on the New York State Teacher Certification Examination teacher performance assessment, the educating all students test, and the content specialty test(s) in the area of the certificate, when available, except that a candidate seeking an initial certificate in the title of Speech and Language Disabilities (all grades) shall not be required to achieve a satisfactory level of performance on the content specialty test or the teacher performance assessment and a candidate seeking an initial certificate in the title of Educational Technology Specialist (all grades) shall not be required to achieve a satisfactory level of performance on the teacher performance assessment.

(b) . . .

(ii) . . .

8. A new subdivision (d) shall be added to section 80-3.3 of the Regulations of the Commissioner of Education to read as follows:

(d) Requirements for an initial certificate in computer science for candidates who hold a bachelor's degree or higher and have satisfactory industry experience in the field.

(1) The requirements of this paragraph are only applicable to candidates who possess a bachelor's degree or higher, and at least three years of documented and satisfactory occupational work experience in computer science, or a related area, as determined by the department. The candidate shall meet the requirements in each of the following subparagraphs:

(i) Education. The candidate shall meet the education requirement through satisfactory completion of a bachelor's degree or higher from a regionally accredited higher education institution or an equivalently approved higher education institution as determined by the department.

(ii) Pedagogy coursework. The candidate shall complete 18 semester hours of coursework that includes study in each of the following subjects:

(a) human development and learning, including but not limited to the impact of culture, heritage, socioeconomic level and factors in the home, school and community that may affect a student's readiness to learn;

(b) teaching students with disabilities and special health-care needs to develop the skills necessary to provide specially designed instruction to students with disabilities to participate and progress in the general education curriculum, three semester hours;

(c) teaching literacy skills, three semester hours;

(d) curriculum, instruction, and assessment, including instructional technology;

and

(e) foundations of education (historical, philosophical, sociological and/or legal).

(ii) Experience. The candidate shall have at least three years of documented and satisfactory occupational work experience in computer science, or a related area, as determined by the department;

(iii) Examination. The candidate shall pass the New York State Teacher Certification Examination Educating all Students test, the content specialty test when available, and the teacher performance assessment, when available in the computer science area.

9. A new section 80-3.14 of the Regulations of the Commissioner of Education shall be added to read as follows:

§80-3.14 Statement of continued eligibility for teachers of computer science.

(i) Upon application, any person holding a valid certificate in the classroom teaching service and employed within the five years immediately preceding September 1, 2022, as a teacher of computer science courses in a New York State public school or board of cooperative educational services or any other school where teacher certification is required, may be issued a statement of continued eligibility so that such person may continue to teach computer science courses in the employing school district, school or board of cooperative educational services. The statement of continued eligibility shall be valid for ten years from the date the statement of continued eligibility is issued and the candidate shall not be required to hold a computer science certificate as prescribed in section 80-3.2 of this Title, provided such person holds a permanent or professional certificate in another certification area in the classroom teaching service.

(ii) A statement of continued eligibility shall only be valid for service in the school district, board of cooperative educational services, or other school that employed such individual when the statement of continued eligibility was issued.

(iii) Applications for the statement of continued eligibility must be filed with the department on or before September 1, 2022.

10. Paragraph (1) of subdivision (a) of section 80-3.7 of the Regulations of the Commissioner of Education shall be amended to read as follows:

(1) A candidate seeking to fulfill the education requirement for an initial certificate through individual evaluation of education requirements shall meet the general requirements prescribed in paragraph (2) of this subdivision, and the additional requirements, if any, prescribed in paragraph (3) of this subdivision for the certificate title for which application is made. The following initial certificates have no additional requirements prescribed in paragraph (3) of this subdivision: dance (all grades), health education (all grades), music (all grades), physical education (all grades), theater (all grades), visual arts (all grades), educational technology specialist (all grades), agriculture (all grades), family and consumer sciences (all grades), business and marketing (all grades), [and] technology education (all grades) and computer science (all grades).

11. Subparagraph (iv) of paragraph (2) of subdivision (a) of section 80-3.7 of the Regulations of the Commissioner of Education shall be amended to read as follows:

(iv) Content core. The candidate shall complete 30 semester hours of coursework in the subject area of the certificate title, which may include no more than six of the 30 semester hours in a cognate, meaning a related field as determined by the department; provided, however that a candidate seeking an initial certificate in computer science shall only be required to complete 12 semester hours of coursework in the subject area of the certificate title.