

The State Board of Education (SBOE) proposes amendments to §74.12 and §74.13, concerning graduation requirements. The proposed amendments would align with recent changes to the Texas Essential Knowledge and Skills (TEKS) for fine arts and establish courses to be included in a cybersecurity pathway for the science, technology, engineering, and mathematics (STEM) endorsement.

BACKGROUND INFORMATION AND JUSTIFICATION: The 83rd Texas Legislature, Regular Session, 2013, passed House Bill (HB) 5, amending Texas Education Code (TEC), §28.025, to transition from three high school graduation programs to one foundation high school program with endorsement options to increase flexibility for students. HB 5 gave the SBOE the authority to identify advanced courses related to the new graduation program, identify the curriculum requirements for the endorsements, and determine the requirements for performance acknowledgments related to the new graduation program.

The 85th Texas Legislature, Regular Session, 2017, passed HB 3593, amending TEC, §28.025(c-1)(1), to add cybersecurity and computer coding to the courses to be included in a STEM endorsement. HB 3593 also added TEC, §28.025(c-10), to require the SBOE to adopt or select five technology applications courses to be included in a cybersecurity pathway for the STEM endorsement. In August 2018, a committee of secondary and postsecondary educators and business and industry representatives were selected to develop recommendations for TEKS for new cybersecurity courses and for the cybersecurity pathway. The committee met again in October 2018 and January 2019 to finalize their recommendations.

For students to earn state credit toward specific graduation requirements, a course must be approved by the SBOE and included in SBOE rule. At the September 2017 SBOE meeting, the committee discussed International Baccalaureate (IB) courses that are not currently included in SBOE rule and considerations regarding the appropriate amount of state credit that should be awarded for IB courses. At that time, the board requested that agency staff prepare rule text to address these issues. Throughout 2018, the SBOE adopted rules to align the TEKS with current course offerings by the International Baccalaureate Organization. In September 2018, the SBOE discussed the addition of two currently approved innovative courses, IB Film Standard Level and IB Film Higher Level, to the TEKS for fine arts, and in November 2018, the SBOE approved for first reading and filing authorization the proposal to add the two new courses.

The proposed amendment to §74.12, Foundation High School Program, would add IB Film Standard or Higher Level to the list of courses that would satisfy a fine arts credit. Language would also be added to clarify that the third and fourth English credits may consist of a comparable IB course that meets the TEKS for English III or IV, respectively. In addition, technical corrections would be made.

The proposed amendment to §74.13, Endorsements, would establish course options for a cybersecurity pathway for the STEM endorsement.

The SBOE approved the amendments for first reading and filing authorization at its February 1, 2019 meeting.

FISCAL IMPACT: Monica Martinez, associate commissioner for standards and support services, has determined that for the first five-year period the proposal is in effect there are no additional costs to state or local government required to comply with the proposal.

LOCAL EMPLOYMENT IMPACT: The proposal has no effect on local economy; therefore, no local employment impact statement is required under Texas Government Code, §2001.022.

SMALL BUSINESS, MICROBUSINESS, AND RURAL COMMUNITY IMPACT: The proposal has no direct adverse economic impact for small businesses, microbusinesses, or rural communities; therefore, no regulatory flexibility analysis specified in Texas Government Code, §2006.002, is required.

COST INCREASE TO REGULATED PERSONS: The proposal does not impose a cost on regulated persons, another state agency, a special district, or a local government and, therefore, is not subject to Texas Government Code, §2001.0045.

TAKINGS IMPACT ASSESSMENT: The proposal does not impose a burden on private real property and, therefore, does not constitute a taking under Texas Government Code, §2007.043.

GOVERNMENT GROWTH IMPACT: TEA staff prepared a Government Growth Impact Statement assessment for this proposed rulemaking. The proposed rulemaking would not create or eliminate a government program; would not require the creation of new employee positions or elimination of existing employee positions; would not require an increase or decrease in future legislative appropriations to the agency; would not require an increase or decrease in fees paid to the agency; would not create a new regulation; would not expand, limit, or repeal an existing regulation; would not increase or decrease the number of individuals subject to its applicability; and would not positively or adversely affect the state's economy.

PUBLIC BENEFIT AND COST TO PERSONS: Ms. Martinez has determined that for each year of the first five years the proposal is in effect, the public benefit anticipated as a result of enforcing the proposal would be added flexibility in course options for students to meet high school graduation requirements. There is no anticipated economic cost to persons who are required to comply with the proposal.

DATA AND REPORTING IMPACT: The proposal would have no new data and reporting impact.

PRINCIPAL AND CLASSROOM TEACHER PAPERWORK REQUIREMENTS: TEA has determined that the proposal would not require a written report or other paperwork to be completed by a principal or classroom teacher.

PUBLIC COMMENTS: The public comment period on the proposal begins February 22, 2019, and ends March 29, 2019. A form for submitting public comments is available on the TEA website at [https://tea.texas.gov/About_TEA/Laws_and_Rules/SBOE_Rules_\(TAC\)/Proposed_State_Board_of_Education_Rules/](https://tea.texas.gov/About_TEA/Laws_and_Rules/SBOE_Rules_(TAC)/Proposed_State_Board_of_Education_Rules/). Comments on the proposal may also be submitted to Cristina De La Fuente-Valadez, Rulemaking, Texas Education Agency, 1701 North Congress Avenue, Austin, Texas 78701. The SBOE will take registered oral and written comments on the proposal at the appropriate committee meeting in April 2019 in accordance with the SBOE board operating policies and procedures. A request for a public hearing on the proposal submitted under the Administrative Procedure Act must be received by the commissioner of education not more than 14 calendar days after notice of the proposal has been published in the *Texas Register* on February 22, 2019.

STATUTORY AUTHORITY. The amendments are proposed under Texas Education Code (TEC), §7.102(c)(4), which requires the State Board of Education (SBOE) to establish curriculum and graduation requirements; TEC, §28.002(a), which identifies the subjects of the required curriculum; TEC, §28.002(c), which requires the SBOE to by rule identify the essential knowledge and skills of each subject in the required curriculum that all students should be able to demonstrate and that will be used in evaluating instructional materials and addressed on the state assessment instruments; TEC, §28.002(f)(2), which requires the SBOE to approve courses in cybersecurity for credit for high school graduation; TEC, §28.025(a), which requires the SBOE to by rule determine the curriculum requirements for the foundation high school program that are consistent with the required curriculum under TEC, §28.002, and to designate the specific courses in the foundation curriculum that are required under the foundation high school program; TEC, §28.025(b-1), which requires the SBOE to by rule require that the curriculum requirements for the foundation high school program include a requirement that students successfully complete four credits in English language arts, including one credit in English I, one credit in English II, one credit in English III, and one credit in an advanced English course; three credits in mathematics, including one credit in Algebra I, one credit in geometry, and one credit in any advanced mathematics course; three credits in science, including one credit in biology, one credit in any advanced science course, and one credit in integrated physics and chemistry or in an additional advanced science course; three credits in social studies, including one credit in United States history, at least one-half credit in government and at least one-half credit in economics, and one credit in world geography or world history; two credits in the same language in a language other than English; five elective credits; one credit in fine arts; and one credit in physical education; TEC, §28.025(c-1), which requires the SBOE to by rule provide students with multiple options for earning each endorsement, including, to the greatest extent possible, coherent sequences of courses. The SBOE by rule must permit a student to enroll in courses under more than one endorsement curriculum before the student's junior year; TEC, §28.025(c-1)(1), which establishes that an endorsement may be earned in science, technology, engineering, and mathematics (STEM), which includes courses related to science, including environmental science; technology, including computer science, cybersecurity, and computer coding; engineering; and advanced mathematics; TEC, §28.025(c-2), which requires the SBOE, in

adopting rules, to require a student in order to earn any endorsement to successfully complete four credits in mathematics, which must include Algebra I, geometry, and two advanced mathematics courses; four credits in science, which must include biology, integrated physics and chemistry or an additional advanced science course, and two advanced science courses or an advanced career and technology course; and two additional elective credits. The SBOE, in adopting rules, is also required to develop additional curriculum requirements for each endorsement with the direct participation of educators and business, labor, and industry representatives and to require each school district to report to the agency the categories of endorsements for which the district offers all courses for curriculum requirements, as determined by board rule; and TEC, §28.025(c-10), which requires the SBOE to adopt or select five technology applications courses on cybersecurity to be included in a cybersecurity pathway for the STEM endorsement.

CROSS REFERENCE TO STATUTE. The amendments implement Texas Education Code, §§7.102(c)(4), 28.002, and 28.025.

<rule>

§74.12. Foundation High School Program.

- (a) (No change.)
- (b) Core courses. A student must demonstrate proficiency in the following.
 - (1) English language arts--four credits. Two of the credits must consist of English I and II. (Students with limited English proficiency who are at the beginning or intermediate level of English language proficiency, as defined by §74.4(d) of this title (relating to English Language Proficiency Standards), may satisfy the English I and English II graduation requirements by successfully completing English I for Speakers of Other Languages and English II for Speakers of Other Languages.) A third credit must consist of English III, ~~[or]~~ a comparable Advanced Placement (AP) ~~[or International Baccalaureate (IB)]~~ English language arts course that does not count toward another credit required for graduation, or a comparable International Baccalaureate (IB) English language arts course that meets all the requirements in §110.33 of this title (relating to English Language Arts and Reading, English III (One Credit), Beginning with School Year 2009-2010). A fourth credit may be selected from one full credit or a combination of two half credits from two different courses, subject to prerequisite requirements, from the following courses:
 - (A) English IV;
 - (B) Independent Study in English;
 - (C) Literary Genres;
 - (D) Creative Writing;
 - (E) Research and Technical Writing;
 - (F) Humanities;
 - (G) Public Speaking III;
 - (H) Communication Applications, which must be combined with another half credit from the other courses listed in subparagraphs (A)-(G) and (I)-(S) of this paragraph;
 - (I) Oral Interpretation III;
 - (J) Debate III;
 - (K) Independent Study in Speech;
 - (L) Independent Study in Journalism;
 - (M) Advanced Broadcast Journalism III;
 - (N) Advanced Journalism: Newspaper III;

- (O) Advanced Journalism: Yearbook III;
 - (P) a comparable Advanced Placement (AP) ~~[or International Baccalaureate (IB)]~~ English language arts course that does not count toward another credit required for graduation;
 - (Q) a comparable International Baccalaureate (IB) English language arts course that meets all the requirements in §110.34 of this title (relating to English Language Arts and Reading, English IV (One Credit), Beginning with School Year 2009-2010);
 - (R) ~~(Q)~~ after the successful completion of English I, II, and III, a locally developed English language arts course or other activity, including an apprenticeship or training hours needed to obtain an industry-recognized credential or certificate that is developed pursuant to the Texas Education Code (TEC), §28.002(g-1);
 - (S) ~~(R)~~ Business English; and
 - (T) ~~(S)~~ a college preparatory English language arts course that is developed pursuant to the TEC, §28.014.
- (2) Mathematics--three credits. Two of the credits must consist of Algebra I and Geometry.
- (A) The additional credit may be selected from one full credit or a combination of two half credits from two different courses, subject to prerequisite requirements, from the following courses or a credit selected from the courses listed in subparagraph (B) of this paragraph:
 - (i) Mathematical Models with Applications;
 - (ii) Mathematical Applications in Agriculture, Food, and Natural Resources;
 - (iii) Digital Electronics;
 - (iv) Robotics Programming and Design;
 - (v) Financial Mathematics;
 - (vi) Applied Mathematics for Technical Professionals;
 - (vii) Accounting II;
 - (viii) Manufacturing Engineering Technology II; and
 - (ix) Robotics II.
 - (B) The additional credit may be selected from one full credit or a combination of two half credits from two different courses, subject to prerequisite requirements, from the following courses:
 - (i) Algebra II;
 - (ii) Precalculus;
 - (iii) Advanced Quantitative Reasoning;
 - (iv) Independent Study in Mathematics;
 - (v) Discrete Mathematics for Problem Solving;
 - (vi) Algebraic Reasoning;
 - (vii) Statistics;
 - (viii) a comparable AP or IB mathematics course that does not count toward another credit required for graduation;
 - (ix) AP Computer Science A;
 - (x) IB Computer Science Higher Level;

- (xi) Engineering Mathematics;
 - (xii) Statistics and Business Decision Making;
 - (xiii) Mathematics for Medical Professionals;
 - (xiv) Discrete Mathematics for Computer Science;
 - (xv) pursuant to the TEC, §28.025(b-5), after the successful completion of Algebra II, a mathematics course endorsed by an institution of higher education as a course for which the institution would award course credit or as a prerequisite for a course for which the institution would award course credit. The Texas Education Agency (TEA) shall maintain a current list of courses offered under this clause ~~[subparagraph]~~; and
 - (xvi) after the successful completion of Algebra I and Geometry, a locally developed mathematics course or other activity, including an apprenticeship or training hours needed to obtain an industry-recognized credential or certificate that is developed pursuant to the TEC, §28.002(g-1).
- (C) A single two-credit IB mathematics course may only satisfy one mathematics requirement.
- (3) Science--three credits. One credit must consist of Biology or a comparable AP or IB biology course.
- (A) One credit must be selected from the following laboratory-based courses:
- (i) Integrated Physics and Chemistry;
 - (ii) Chemistry;
 - (iii) Physics;
 - (iv) Principles of Technology; and
 - (v) a comparable AP or IB chemistry or physics course that does not count toward another credit required for graduation.
- (B) The additional credit may be selected from one full credit or a combination of two half credits from two different courses, subject to prerequisite requirements, from the following laboratory-based courses:
- (i) Chemistry;
 - (ii) Physics;
 - (iii) Aquatic Science;
 - (iv) Astronomy;
 - (v) Earth and Space Science;
 - (vi) Environmental Systems;
 - (vii) a comparable AP or IB science course that does not count toward another credit required for graduation;
 - (viii) Advanced Animal Science;
 - (ix) Advanced Plant and Soil Science;
 - (x) Anatomy and Physiology;
 - (xi) Medical Microbiology;
 - (xii) Pathophysiology;
 - (xiii) Food Science;

- (xiv) Forensic Science;
 - (xv) Biotechnology I;
 - (xvi) Biotechnology II;
 - (xvii) Principles of Technology;
 - (xviii) Scientific Research and Design;
 - (xix) Engineering Design and Problem Solving;
 - (xx) Engineering Science;
 - (xxi) pursuant to the TEC, §28.025(b-5), after the successful completion of physics, a science course endorsed by an institution of higher education as a course for which the institution would award course credit or as a prerequisite for a course for which the institution would award course credit. The TEA shall maintain a current list of courses offered under this clause; and
 - (xxii) a locally developed science course or other activity, including an apprenticeship or training hours needed to obtain an industry-recognized credential or certificate that is developed pursuant to the TEC, §28.002(g-1).
- (C) Credit may not be earned for both physics and Principles of Technology to satisfy science credit requirements.
- (D) A single two-credit IB science course may only satisfy one science requirement.
- (4) Social studies--three credits. Two of the credits must consist of United States History Studies Since 1877 (one credit), United States Government (one-half credit), and Economics with Emphasis on the Free Enterprise System and Its Benefits (one-half credit). The additional credit may be selected from the following courses:
- (A) World History Studies; or [~~and~~]
 - (B) World Geography Studies; or [~~and~~]
 - (C) a comparable AP or IB world history or world geography course that does not count toward another credit required for graduation.
- (5) Languages other than English (LOTE)--two credits.
- (A) The credits may be selected from the following:
 - (i) any two levels in the same language, including comparable AP or IB language courses that do not count toward another credit required for graduation; or
 - (ii) two credits in computer programming languages, including computer coding, to be selected from Computer Science I, II, and III, AP Computer Science Principles, AP Computer Science A, IB Computer Science Standard Level, and IB Computer Science Higher Level.
 - (B) A single two-credit IB LOTE course may only satisfy one LOTE requirement.
 - (C) If a student, in completing the first credit of LOTE, demonstrates that the student is unlikely to be able to complete the second credit, the student may substitute another appropriate course as follows:
 - (i) Special Topics in Language and Culture;
 - (ii) World History Studies or World Geography Studies for a student who is not required to complete both by the local district;
 - (iii) another credit selected from Chapter 114 of this title (relating to Texas Essential Knowledge and Skills for Languages Other Than English); or

- (iv) computer programming languages, including computer coding.
- (D) The determination regarding a student's ability to complete the second credit of LOTE must be agreed to by:
- (i) the teacher of the first LOTE credit course or another LOTE teacher designated by the school district, the principal or designee, and the student's parent or person standing in parental relation;
 - (ii) the student's admission, review, and dismissal (ARD) committee if the student receives special education services under the TEC, Chapter 29, Subchapter A; or
 - (iii) the committee established for the student under Section 504, Rehabilitation Act of 1973 (29 United States Code, Section 794) if the student does not receive special education services under the TEC, Chapter 29, Subchapter A, but is covered by the Rehabilitation Act of 1973.
- (E) A student, who due to a disability, is unable to complete two credits in the same language in a language other than English, may substitute a combination of two credits that are not being used to satisfy another specific graduation requirement selected from English language arts, mathematics, science, or social studies or two credits in career and technical education or technology applications for the LOTE credit requirements. The determination regarding a student's ability to complete the LOTE credit requirements will be made by:
- (i) the student's ARD committee if the student receives special education services under the TEC, Chapter 29, Subchapter A; or
 - (ii) the committee established for the student under Section 504, Rehabilitation Act of 1973 (29 United States Code, Section 794) if the student does not receive special education services under the TEC, Chapter 29, Subchapter A, but is covered by the Rehabilitation Act of 1973.
- (F) A student who successfully completes a dual language immersion/two-way or dual language immersion/one-way program in accordance with §89.1210(d)(3) and (4) of this title (relating to Program Content and Design), §89.1227 of this title (relating to Minimum Requirements for Dual Language Immersion Program Model), and §89.1228 of this title (relating to Two-Way Dual Language Immersion Program Model Implementation) at an elementary school may satisfy one credit of the two credits required in a language other than English.
- (i) To successfully complete a dual language immersion program, a student must:
 - (I) have participated in a dual language immersion program for at least five consecutive school years;
 - (II) achieve high levels of academic competence as demonstrated by performance of meets or masters grade level on the State of Texas Assessments of Academic Readiness (STAAR®) in English or Spanish, as applicable; and
 - (III) achieve proficiency in both English and a language other than English as demonstrated by scores of proficient or higher in the reading and speaking domains on language proficiency or achievement tests in both languages.
 - (ii) The second credit of a language other than English must be in the same language as the successfully completed dual language immersion program.
- (6) Physical education--one credit.
- (A) The required credit may be selected from any combination of the following one-half to one credit courses:

- (i) Foundations of Personal Fitness;
 - (ii) Adventure/Outdoor Education;
 - (iii) Aerobic Activities; and
 - (iv) Team or Individual Sports.
- (B) In accordance with local district policy, the required credit may be earned through completion of any Texas essential knowledge and skills-based course that meets the requirement in subparagraph (E) of this paragraph for 100 minutes of moderate to vigorous physical activity per five-day school week and that is not being used to satisfy another specific graduation requirement.
- (C) In accordance with local district policy, credit for any of the courses listed in subparagraph (A) of this paragraph may be earned through participation in the following activities:
- (i) Athletics;
 - (ii) Junior Reserve Officer Training Corps (JROTC); and
 - (iii) appropriate private or commercially sponsored physical activity programs conducted on or off campus. The district must apply to the commissioner of education for approval of such programs, which may be substituted for state graduation credit in physical education. Such approval may be granted under the following conditions.
 - (I) Olympic-level participation and/or competition includes a minimum of 15 hours per week of highly intensive, professional, supervised training. The training facility, instructors, and the activities involved in the program must be certified by the superintendent to be of exceptional quality. Students qualifying and participating at this level may be dismissed from school one hour per day. Students dismissed may not miss any class other than physical education.
 - (II) Private or commercially sponsored physical activities include those certified by the superintendent to be of high quality and well supervised by appropriately trained instructors. Student participation of at least five hours per week must be required. Students certified to participate at this level may not be dismissed from any part of the regular school day.
- (D) In accordance with local district policy, up to one credit for any one of the courses listed in subparagraph (A) of this paragraph may be earned through participation in any of the following activities:
- (i) Drill Team;
 - (ii) Marching Band; and
 - (iii) Cheerleading.
- (E) All substitution activities allowed in subparagraphs (B)-(D) of this paragraph must include at least 100 minutes per five-day school week of moderate to vigorous physical activity.
- (F) Credit may not be earned more than once for any course identified in subparagraph (A) of this paragraph. No more than four substitution credits may be earned through any combination of substitutions allowed in subparagraphs (B)-(D) of this paragraph.
- (G) A student who is unable to participate in physical activity due to disability or illness may substitute an academic elective credit (English language arts, mathematics, science, or social studies) or a course that is offered for credit as provided by the TEC, §28.002(g-1),

for the physical education credit requirement. The determination regarding a student's ability to participate in physical activity will be made by:

- (i) the student's ARD committee if the student receives special education services under the TEC, Chapter 29, Subchapter A;
- (ii) the committee established for the student under Section 504, Rehabilitation Act of 1973 (29 United States Code, Section 794) if the student does not receive special education services under the TEC, Chapter 29, Subchapter A, but is covered by the Rehabilitation Act of 1973; or
- (iii) a committee established by the school district of persons with appropriate knowledge regarding the student if each of the committees described by clauses (i) and (ii) of this subparagraph is inapplicable. This committee shall follow the same procedures required of an ARD or a Section 504 committee.

(7) Fine arts--one credit.

(A) The credit may be selected from the following courses subject to prerequisite requirements:

- (i) Art, Level I, II, III, or IV;
- (ii) Dance, Level I, II, III, or IV;
- (iii) Music, Level I, II, III, or IV;
- (iv) Music Studies;
- (v) Theatre, Level I, II, III, or IV;
- (vi) Musical Theatre, Level I, II, III, or IV;
- (vii) Technical Theatre, Level I, II, III, or IV;

(viii) IB Film Standard or Higher Level;

(ix) ~~(viii)~~ Floral Design;

(x) ~~(ix)~~ Digital Art and Animation; and

(xi) ~~(x)~~ 3-D Modeling and Animation.

(B) In accordance with local district policy, credit may be earned through participation in a community-based fine arts program not provided by the school district in which the student is enrolled. The district must apply to the commissioner of education for approval of such programs, which may be substituted for state graduation credit in fine arts. Approval may be granted if the fine arts program provides instruction in the essential knowledge and skills identified for a fine arts course as defined by Chapter 117, Subchapter C, of this title (relating to High School, Adopted 2013).

(c)-(d) (No change.)

§74.13. Endorsements.

(a)-(d) (No change.)

(e) To earn an endorsement a student must demonstrate proficiency in the following.

(1) The curriculum requirements for the Foundation High School Program as defined by §74.12 of this title (relating to Foundation High School Program).

(2) A fourth credit in mathematics that may be selected from one full credit or a combination of two half credits from two different courses, subject to prerequisite requirements, from the following courses:

(A) Algebra II;

- (B) Precalculus;
 - (C) Advanced Quantitative Reasoning;
 - (D) Independent Study in Mathematics;
 - (E) Discrete Mathematics for Problem Solving;
 - (F) Algebraic Reasoning;
 - (G) Statistics;
 - (H) a comparable Advanced Placement (AP) or International Baccalaureate (IB) mathematics course that does not count toward another credit required for graduation;
 - (I) AP Computer Science A;
 - (J) IB Computer Science Higher Level;
 - (K) Engineering Mathematics;
 - (L) Statistics and Business Decision Making;
 - (M) Mathematics for Medical Professionals;
 - (N) Discrete Mathematics for Computer Science;
 - (O) pursuant to the Texas Education Code (TEC), §28.025(b-5), after the successful completion of Algebra II, a mathematics course endorsed by an institution of higher education as a course for which the institution would award course credit or as a prerequisite for a course for which the institution would award course credit. The Texas Education Agency (TEA) shall maintain a current list of courses offered under this subparagraph; and
 - (P) after the successful completion of Algebra I and Geometry, a locally developed mathematics course or other activity, including an apprenticeship or training hours needed to obtain an industry-recognized credential or certificate that is developed pursuant to the TEC, §28.002(g-1).
- (3) A student may complete a course listed in paragraph (2) of this subsection before or after completing a course listed in §74.12(b)(2)(A) of this title.
- (4) The fourth mathematics credit may be a college preparatory mathematics course that is developed and offered pursuant to the TEC, §28.014.
- (5) A single two-credit IB mathematics course may only satisfy one mathematics requirement.
- (6) An additional credit in science that may be selected from one full credit or a combination of two half credits from two different courses, subject to prerequisite requirements, from the following courses:
- (A) Chemistry;
 - (B) Physics;
 - (C) Aquatic Science;
 - (D) Astronomy;
 - (E) Earth and Space Science;
 - (F) Environmental Systems;
 - (G) a comparable AP or IB science course that does not count toward another credit required for graduation;
 - (H) Advanced Animal Science;
 - (I) Advanced Plant and Soil Science;

- (J) Anatomy and Physiology;
 - (K) Medical Microbiology;
 - (L) Pathophysiology;
 - (M) Food Science;
 - (N) Forensic Science;
 - (O) Biotechnology I;
 - (P) Biotechnology II;
 - (Q) Principles of Technology;
 - (R) Scientific Research and Design;
 - (S) Engineering Design and Problem Solving;
 - (T) Engineering Science;
 - (U) pursuant to the TEC, §28.025(b-5), after the successful completion of physics, a science course endorsed by an institution of higher education as a course for which the institution would award course credit or as a prerequisite for a course for which the institution would award course credit. The TEA shall maintain a current list of courses offered under this subparagraph;
 - (V) a locally developed science course or other activity, including an apprenticeship or training hours needed to obtain an industry-recognized credential or certificate that is developed pursuant to the TEC, §28.002(g-1);
 - (W) pursuant to the TEC, §28.025(c-3), a student pursuing an arts and humanities endorsement who has the written permission of the student's parent or a person standing in parental relation to the student may substitute a course that is not being used to satisfy another specific graduation requirement selected from:
 - (i) Chapter 110 of this title (relating to Texas Essential Knowledge and Skills for English Language Arts and Reading);
 - (ii) Chapter 113 of this title (relating to Texas Essential Knowledge and Skills for Social Studies) or Chapter 118 of this title (relating to Texas Essential Knowledge and Skills for Economics with Emphasis on the Free Enterprise System and Its Benefits);
 - (iii) Chapter 114 of this title (relating to Texas Essential Knowledge and Skills for Languages Other Than English); or
 - (iv) Chapter 117 of this title (relating to Texas Essential Knowledge and Skills for Fine Arts); and
 - (X) credit may not be earned for both physics and Principles of Technology to satisfy science credit requirements.
 - (Y) A single two-credit IB science course may only satisfy one science requirement.
- (7) Two additional elective credits that may be selected from the list of courses specified in §74.11(g) or (h) of this title (relating to High School Graduation Requirements).
- (f) A student may earn any of the following endorsements.
- (1) Science, technology, engineering, and mathematics (STEM). A student may earn a STEM endorsement by completing the requirements specified in subsection (e) of this section, including Algebra II, chemistry, and physics or Principles of Technology and:
 - (A) a coherent sequence of courses for four or more credits in career and technical education (CTE) that consists of at least two courses in the same career cluster and at least one

advanced CTE course. The courses may be selected from Chapter 130 of this title (relating to Texas Essential Knowledge and Skills for Career and Technical Education), Chapter 127 of this title (relating to Texas Essential Knowledge and Skills for Career Development), or CTE innovative courses approved by the commissioner of education. The final course in the sequence must be selected from Chapter 130, Subchapter O, of this title (relating to Science, Technology, Engineering, and Mathematics) or Career Preparation I or II and Project-Based Research in Chapter 127, Subchapter B, of this title (relating to High School), if the course addresses a STEM-related field; or

- (B) a coherent sequence of four credits in computer science selected from the following:
 - (i) Fundamentals of Computer Science; or
 - (ii) Computer Science I; or
 - (iii) Computer Science II; or
 - (iv) Computer Science III; or
 - (v) Digital Forensics; or
 - (vi) Discrete Mathematics for Computer Science; or
 - (vii) Game Programming and Design; or
 - (viii) Mobile Application Development; or
 - (ix) Robotics Programming and Design; or
 - (x) Independent Studies in Technology Applications; or
 - (xi) AP Computer Science A; or
 - (xii) AP Computer Science Principles; or
 - (xiii) IB Computer Science, Standard Level; or
 - (xiv) IB Computer Science, Higher Level; or
- (C) three credits in mathematics by successfully completing Algebra II and two additional mathematics courses for which Algebra II is a prerequisite by selecting courses from subsection (e)(2) of this section; or
- (D) four credits in science by successfully completing chemistry, physics, and two additional science courses by selecting courses from subsection (e)(6) [~~(e)(5)~~] of this section; or
- ~~(E)~~ (F) a coherent sequence of four courses in cybersecurity to consist of Foundations in Cybersecurity and Cybersecurity Capstone and two additional courses to be selected from the following:
 - (i) AP Computer Science A; or
 - (ii) Computer Science I; or
 - (iii) AP Computer Science Principles; or
 - (iv) Digital Forensics; or
 - (v) Computer Maintenance; or
 - (vi) Internetworking Technologies I; or
 - (vii) Internetworking Technologies II; or
 - (viii) Networking; or
- ~~(F)~~ (F) in addition to Algebra II, chemistry, and physics, a coherent sequence of three additional credits from no more than two of the categories or disciplines represented by subparagraphs (A), (B), (C), and (D) of this paragraph.

- (2) Business and industry. A student may earn a business and industry endorsement by completing the requirements specified in subsection (e) of this section and:
- (A) a coherent sequence of courses for four or more credits in CTE that consists of at least two courses in the same career cluster and at least one advanced CTE course. The courses may be selected from Chapter 130 of this title, Chapter 127 of this title, or CTE innovative courses approved by the commissioner. The final course in the sequence must be selected from one of the following:
- (i) Chapter 130, Subchapter A, of this title (relating to Agriculture, Food, and Natural Resources); or
 - (ii) Chapter 130, Subchapter B, of this title (relating to Architecture and Construction); or
 - (iii) Chapter 130, Subchapter C, of this title (relating to Arts, Audio/Video Technology, and Communications); or
 - (iv) Chapter 130, Subchapter D, of this title (relating to Business Management and Administration); or
 - (v) Chapter 130, Subchapter F, of this title (relating to Finance); or
 - (vi) Chapter 130, Subchapter I, of this title (relating to Hospitality and Tourism); or
 - (vii) Chapter 130, Subchapter K, of this title (relating to Information Technology); or
 - (viii) Chapter 130, Subchapter M, of this title (relating to Manufacturing); or
 - (ix) Chapter 130, Subchapter N, of this title (relating to Marketing); or
 - (x) Chapter 130, Subchapter P, of this title (relating to Transportation, Distribution, and Logistics); or
 - (xi) Career Preparation I or II and Project-Based Research in Chapter 127, Subchapter B, of this title if the course addresses a career from a field listed in clauses (i)-(x) of this subparagraph; or
- (B) four English credits by selecting courses from Chapter 110 of this title to include three levels in one of the following areas:
- (i) public speaking; or
 - (ii) debate; or
 - (iii) advanced broadcast journalism; or
 - (iv) advanced journalism: newspaper; or
 - (v) advanced journalism: yearbook; or
 - (vi) advanced journalism: literary magazine; or
- (C) four technology applications credits by selecting from the following:
- (i) Digital Design and Media Production; or
 - (ii) Digital Art and Animation; or
 - (iii) 3-D Modeling and Animation; or
 - (iv) Digital Communications in the 21st Century; or
 - (v) Digital Video and Audio Design; or
 - (vi) Web Communications; or
 - (vii) Web Design; or

- (viii) Web Game Development; or
 - (ix) Independent Study in Evolving/Emerging Technologies; or
 - (D) a coherent sequence of four credits from subparagraph (A), (B), or (C) of this paragraph.
- (3) Public services. A student may earn a public services endorsement by completing the requirements specified in subsection (e) of this section and:
 - (A) a coherent sequence of courses for four or more credits in CTE that consists of at least two courses in the same career cluster and at least one advanced CTE course. The courses may be selected from Chapter 130 of this title, Chapter 127 of this title, or CTE innovative courses approved by the commissioner. The final course in the sequence must be selected from one of the following:
 - (i) Chapter 130, Subchapter E, of this title (relating to Education and Training); or
 - (ii) Chapter 130, Subchapter G, of this title (relating to Government and Public Administration); or
 - (iii) Chapter 130, Subchapter H, of this title (relating to Health Science); or
 - (iv) Chapter 130, Subchapter J, of this title (relating to Human Services); or
 - (v) Chapter 130, Subchapter L, of this title (relating to Law, Public Safety, Corrections, and Security); or
 - (vi) Career Preparation I or II and Project-Based Research in Chapter 127, Subchapter B, of this title if the course addresses a field from a cluster listed in clauses (i)-(v) of this subparagraph; or
 - (B) four courses in Junior Reserve Officer Training Corps (JROTC).
- (4) Arts and humanities. A student may earn an arts and humanities endorsement by completing the requirements specified in subsection (e) of this section and:
 - (A) five social studies credits by selecting courses from Chapter 113 of this title or Chapter 118 of this title (relating to Texas Essential Knowledge and Skills for Economics with Emphasis on the Free Enterprise System and Its Benefits); or
 - (B) four levels of the same language in a language other than English by selecting courses in accordance with Chapter 114 of this title, which may include Advanced Language for Career Applications; or
 - (C) two levels of the same language in a language other than English and two levels of a different language in a language other than English by selecting courses in accordance with Chapter 114 of this title; or
 - (D) four levels of American sign language by selecting courses in accordance with Chapter 114 of this title; or
 - (E) a coherent sequence of four credits by selecting courses from one or two categories or disciplines in fine arts from Chapter 117 of this title or innovative courses approved by the commissioner; or
 - (F) four English credits by selecting from the following:
 - (i) English IV; or
 - (ii) Independent Study in English; or
 - (iii) Literary Genres; or
 - (iv) Creative Writing; or
 - (v) Research and Technical Writing; or

- (vi) Humanities; or
- (vii) Communication Applications; or
- (viii) AP English Literature and Composition; or
- (ix) AP English Language and Composition; or
- (x) IB Language Studies A: Language and Literature Standard Level; or
- (xi) IB Language Studies A: Language and Literature Higher Level; or
- (xii) IB Language Studies A: Literature Standard Level; or
- (xiii) IB Language Studies A: Literature Higher Level; or
- (xiv) IB Literature and Performance Standard Level.

(5) Multidisciplinary studies. A student may earn a multidisciplinary studies endorsement by completing the requirements specified in subsection (e) of this section and:

- (A) four advanced courses that prepare a student to enter the workforce successfully or postsecondary education without remediation from within one endorsement area or among endorsement areas that are not in a coherent sequence; or
- (B) four credits in each of the four foundation subject areas to include chemistry and/or physics and English IV or a comparable AP or IB English course; or
- (C) four credits in Advanced Placement, International Baccalaureate, or dual credit selected from English, mathematics, science, social studies, economics, languages other than English, or fine arts.

(g) (No change.)