

13822, (eff 12-15-23)

INTERIM EXPIRES: 6-12-24

**Readopt with amendment Ed 507.54, effective 11-14-17, (Document #12419), to read as follows:**

Ed 507.54 Computer Science Educator.

(a) A candidate seeking a credential as a computer science educator for grades K-12 shall meet the following education requirements:

(1) Either:

- a. Have at least a bachelor's degree; or
- b. Hold a current industry-recognized credential as defined in RSA 200-O:2, II; and

(2) Meet the requirements of (c) below.

(b) Candidates seeking a credential shall use one of the alternatives in Ed 505.05 – Ed 505.07 after meeting the requirements of (c) below.

(c) A candidate seeking a credential as a computer science educator for grades K-12 shall have the following skills, competencies, and knowledge through a combination of learning activities such as, but not limited to, academic and supervised clinical experience in the following areas:

(1) In the area of impacts of computing, the candidate shall have the ability to:

- a. Use computing to:
  1. Express creativity;
  2. Solve problems;
  3. Communicate;
  4. Collaborate; and
  5. Innovate in a variety of fields and careers;
- b. Assess obstacles to equal access to computing as well as the impacts of these obstacles;
- c. Assess impacts of computing innovations and practices with respect to:
  1. Beneficial and harmful effects;
  2. Ethical practices; and
  3. Privacy, security, and legal issues; and
- d. Keep current with knowledge on emerging technologies and their potential impacts;

(2) In the area of algorithms and computational thinking, the candidate shall have the ability to:

- a. Analyze algorithmic processes and develop algorithms using:
  1. Pattern recognition;

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2. Problem decomposition; and
  3. Abstraction;
  - b. Convert between binary, decimal, and hexadecimal number systems;
  - c. Use different fonts to represent, develop and analyze algorithms including, but not limited to natural language, flowcharts, and pseudocode;
  - d. Use heuristic solutions to address computing limitations including, but not limited to, time, space, and solvability;
  - e. Use standard algorithms including, but not limited to, searching and sorting algorithms and analyze implementations of those algorithms for correctness, efficiency, and clarity; and
  - f. Use simple recursive algorithms including, but not limited to, fractals, Zeno's paradox, and Towers of Hanoi;
- (3) In the area of programming, the candidate shall have the ability to:
- a. Write and modify computer programs in block-based and at least one text-based programming language;
  - b. Analyze computer programs in terms of:
    1. Correctness;
    2. Usability;
    3. Readability;
    4. Extensibility;
    5. Modifiability; and
    6. Reusability;
  - c. Program using the following elements:
    1. Basic control structures;
    2. Standard operators;
    3. Variables and data types;
    4. Functions; and
    5. Data structures;
  - d. Write event-driven programs that respond to external events including, but not limited to, sensors, messages, and clicks;
  - e. Use libraries and APIs;

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- f. Use and evaluate multiple development and execution environments;
  - g. Facilitate collaboration in the development of software;
  - h. Program user interactions with graphical and other user interface components;
  - i. Demonstrate knowledge of various software development models;
  - j. Model practices in software development, including:
    - 1. User requirements analysis;
    - 2. Program design;
    - 3. Implementation and documentation;
    - 4. Testing and debugging; and
    - 5. Evolution driven by feedback;
  - k. Develop object-oriented programs; and
  - l. Model the process of program compilation and interpretation;
- (4) In the area of data and analysis, the candidate shall have the ability to:
- a. Model concepts of processing data, including:
    - 1. Encoding;
    - 2. Compression; and
    - 3. Encryption;
  - b. Create and use models and simulations; and
  - c. Work with data using computational tools, including to:
    - 1. Collect, aggregate, and generate;
    - 2. Store, manage, and manipulate; and
    - 3. Process, analyze, and visualize; and
- (5) In the area of computing systems and networks, the candidate shall have the ability to:
- a. Evaluate and compare computing systems using various criteria;
  - b. Evaluate and compare local, network, and cloud computing and storage;
  - c. Model computer networks in terms of:
    - 1. Protocol stack components; and
    - 2. Network protocols, such as:

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- (i) Transmission control protocol/internet protocol (TCP/IP);
  - (ii) Domain name servers (DNS); and
  - (iii) Hypertext transfer protocol secure (HTTPS); and
- d. Demonstrate fundamental concepts of cybersecurity including, but not limited to, confidentiality, integrity, availability, non-repudiation, and authentication.

**Appendix I**

<b>Rule</b>	<b>Statute</b>
Ed 507.54	RSA 186:11, X(a); RSA 200-O:4, I