As of 2020, 40 states have some form of K-12 computer science (CS) licensure. Code.org outlines two policy recommendations related to licensing of CS teachers: 4) implement clear certification pathways for computer science teachers and 5) create computer science preservice programs at institutions of higher education.

The state of Minnesota does not currently have any licensure specific to CS, although there are several licenses that have authorization to teach CS-related courses. Licensure requirements and processes in Minnesota are overseen by the Professional Licensing and Standards Board (PELSB) and are documented in MN Chapter 8710 Rules (Teacher Standards 8710.3000 – 8710.5850 and Teachers of Career and Technical Education 8710.8010 – 8710.8080). Minnesota uses a tiered system for licensure, summarized here, which allows multiple pathways for teachers to demonstrate their competency. For example, a software engineer with an Associate in Arts degree or 5 years working experience could meet the requirements for a Tier 1 CTE license for Communications and Technology Careers (and would be authorized to teach CS courses).

**Current Minnesota Licenses**

Each licensure area includes assignments that broadly define topics teachers are authorized to teach; however, there is no explicit alignment to courses in the Minnesota Common Course Catalog. For example, technology and mathematics licenses include an assignment for computer programming and technologies and a business license includes computer programming, hardware technology, network technology and web page design assignments. All of these assignments could potentially include CS courses.²

*Integrated CS Content.* In all K-12 grades, CS may be taught integrated with other subjects such as math, science, or English/language arts. In these cases, the teacher only needs a valid Minnesota license to be authorized to teach CS. In Minnesota, licensed teachers in grades K-8 can teach CS as part of general elementary education or in middle school courses. The Math, Science, Technology Integrated Curriculum assignment is used by some schools for teachers teaching integrated content or specialist hours.³

**Definitions**

**Authorization**

Some states authorize teachers to teach CS without a specific CS licensure (i.e., an educator does not need to “prove” that they know CS). The licensure table in this brief (Table 1) identifies which license areas are authorized to teach CS courses and content in Minnesota.

**Licensure**

In most states, teachers demonstrate their knowledge of CS by completing a state-approved education program, passing an exam, or providing a portfolio. In Minnesota, there is no CS-specific licensure.¹ These are the terms used in Minnesota to refer to licensure:

- **Full License:** A full license is a standalone certification in a specific license field for the state of Minnesota allowing an individual to be a teacher of record. Teachers must have an *initial licensure* in at least one area obtained through one of the tiers, but may hold multiple full licenses; subsequent licenses are referred to as *additional licenses.*
- **Endorsement:** An endorsement is a license that is added to an existing license but cannot be used for initial licensure.
Brief #3: K-12 CS Teacher Licensure in Minnesota
#CSforAllMN

Preparation Programs. Currently, out of 32 higher education institutions in the state that offer teacher licensure, there are only two programs that prepare teacher candidates for an initial business education license.¹ Teacher candidates also have limited options for licensure programs in some of the other areas; however, mathematics and elementary education are available in most higher education institutions with teacher preparation programs.

Table 1. Teacher Licenses Authorized to Teach CS in Minnesota

<table>
<thead>
<tr>
<th>Teacher Licensure</th>
<th>CTE Licensure</th>
<th>Elementary or Specialist Licensure</th>
</tr>
</thead>
<tbody>
<tr>
<td>100100 Technology</td>
<td>140500 Business</td>
<td>180100 Elementary Education (up to 33% FTE assignment on keyboarding/computers)</td>
</tr>
<tr>
<td>110000 Mathematics</td>
<td>300000 Communications Technology Careers</td>
<td>149999 Teachers of Computer, Keyboarding, and Related Technology Application (Endorsement)</td>
</tr>
<tr>
<td>140050 Business</td>
<td></td>
<td>94100 Library Media Specialist</td>
</tr>
</tbody>
</table>

CS Licensure Models in Other States
The following examples are models for CS licensure that have been adopted by other states. More information on each of the states can be found in Code.org’s State Policy Tracking document (see the Certification tab).

- **Initial Licensure**: These licenses allow CS teachers to teach a variety of CS courses, usually at the secondary (grades 5-12) level. Concerns with this model include a sufficient number of schools able to hire full-time CS teacher positions as well as the lack of state-approved teacher preparation programs in CS. **State Examples**: Texas, Maryland, South Carolina, and Wisconsin (4-12)

- **Add-On Licensure/Endorsement**: Teachers hold initial licensure in one content area and then demonstrate competency in CS to add-on another licensure or endorsement.
  - **K-12**: Teachers with this license can teach CS at all grade levels including as a specialist in elementary and middle grades or CS courses in middle and high school. A concern is the use of an exam for demonstrating competency (e.g., Praxis or Pearson) which requires elementary teachers to learn advanced programming concepts. **State Examples**: Nebraska and Georgia
  - **Elementary or Secondary**: Teachers with this license can teach at the grade levels specified and demonstrate competency in CS for the CS standards for the relevant grade levels. **State Examples**: Arizona, Connecticut, Hawaii, and Iowa (K-8 or 5-12)

- **Course-Specific Permissions**: Teachers complete professional development from a state-approved provider such as those endorsed by the College Board for AP CS courses. **State Examples**: Alabama, Missouri, Mississippi, and West Virginia

Looking Forward
As CS education grows within the state, K-12 teachers will need more CS-focused preparation in order to be confident and competent in teaching CS courses and content as well as to meet the demands for supporting all students in learning CS. Reviewing and updating CS state licensure requirements should be informed by other state models in order to create solutions that work well for Minnesota. Flexibility in how teachers are licensed will be key in supporting districts to make choices that fit with locally-designed CS pathways. In the next brief, we will examine the capacity of teacher education programs at higher education institutions to support the preparation of K-12 CS teachers.

Additional Resources:
- Recommendations for States Developing Computer Science Teacher Pathways
- Everyone and No One Can Teach CS: Certifications to Teach CS per State
- CSTA Standards for Computer Science Teachers
- Priming the Computer Science Teacher Pump Report

¹ Minnesota Teacher and Related Services Licensure Fields
² PELS 2020-2021 Licensure Assignment Table
³ PELS 2020-2021 Assignment Licensure Table
⁴ Winona State University (undergraduate program) and Bethel University (graduate program)