

977--- STEM Specialist K-12. Due to content being competency driven, college/university recommendation may be required. Authorization. The holder of this endorsement is authorized to serve as a STEM specialist in kindergarten and grades one through twelve

The applicant must have met the requirements for a standard Iowa teaching license and a teaching endorsement in mathematics, science, engineering, industrial technology, or agriculture.

The applicant must hold a master’s degree from a regionally accredited institution. The master’s degree must be in math, science, engineering or technology or another area with at least 12 hours of college-level science and at least 12 hours of college-level math (or completion of Calculus I) to include coursework in computer programming.

Completion of a minimum of 3 semester hours of coursework in content or pedagogy of engineering and technological design that includes engineering design processes or programming logic and problem-solving models and that may be met through either of the following:

- Engineering and technological design courses for education majors;
- Technology or engineering content coursework.

Course #	Course Title	Institution	Semester Hr.	Year Completed

Completion of 9 semester hours in professional development to include the following essential concepts and skills:

- STEM curriculum and methods:
  - Comparing and contrasting the nature and goals of each of the STEM disciplines;
  - Promoting learning through purposeful, authentic, real-world connections;
  - Integration of content and context of each of the STEM disciplines;
  - Interdisciplinary/transdisciplinary approaches to teaching (including but not limited to problem-based learning and project-based learning);
  - Curriculum/standards mapping;
  - Assessment of integrative learning approaches;
  - Information literacy skills in STEM;
  - Processes of science/scientific inquiry;
  - Mathematical problem-solving models;
  - Classroom management in project-based classrooms;
  - Instructional strategies for the inclusive classroom;
  - Computational thinking;
  - Mathematical and technological modeling.
- STEM experiential learning:
  - Engaging subject-matter experts (including but not limited to colleagues, parents, higher education faculty/students, business partners, and informal education agencies) in STEM experiences in and out of the classroom;

STEM Specialist K-12 Endorsement Worksheet

- STEM research experiences;
- STEM internship at a STEM business or informal education organization;
- STEM extracurricular activity;
- Communicating to a variety of audiences.
- Leadership in STEM:
  - STEM curriculum development and assessment;
  - Curriculum mapping;
  - Assessment of student engagement;
  - STEM across the curriculum;
  - Research on best practices in STEM;
  - STEM curriculum accessibility for all students.

Course #	Course Title	Institution	Semester Hr.	Year Completed

**Completion of an internship/externship professional experience or prior professional experience in STEM for a minimum of 90 contact hours.**

Course #	Course Title	Institution	Semester Hr.	Year Completed