

Department of Curriculum & Instruction
University of Arkansas
STEM Program Annual Academic Assessment Report
May 2022

Overview

The STEM program in the Department of Curriculum and Instruction consists of two basic units. These units include: 1) a graduate elementary teacher education program that results in a Graduate Certificate in STEM Education for K-6 teacher education candidates; and, 2) an undergraduate secondary teacher education program that results in a STEM Education Certificate of Proficiency, or a minor in STEM Education, or the completion of course hours toward an Arkansas teaching license in Biology, Chemistry, Mathematics, Physics or Computer Science. This report will outline the assessment reports for these two programs separately as they have no common coursework.

Undergraduate secondary teacher education program assessment report

I. Programs Offered:

- STEM Education Certificate of Proficiency,
- A minor in STEM Education, or
- The completion of course hours toward an Arkansas teaching license in Biology, Chemistry, Mathematics, Physics or Computer Science

II. Results of analysis of assessment of Student Learning Outcomes

- **22** students completed **ARSC 1201** (Introduction to Teaching STEM Subjects) in Fall 2021, and **18** students completed in Spring 2022
- **10** students completed **ARSC 1212** (Field Experience in Teaching STEM Subjects) in Fall 2021, and **15** students completed in Spring 2022
- **21** students completed **STEM 2003** (The Art of STEM Communication) in Fall 2021, and **38** students completed in Spring 2022
- **0** students graduated in Fall 2021 with a **Minor in STEM Education**
- **12** students graduated in Spring 2022 with a **Minor in STEM Education**
- **0** students completed the **STEM Education Certificate of Proficiency** in Fall 2021
- **2** students completed the **STEM Education Certificate of Proficiency** in Spring 2022
- **10** students graduated in the 2021-2022 academic year with a teacher license:
8 - math **0**-biology **0**- chemistry **1**- physics **1**- computer science
- **4** out of 12 program graduates had confirmed post-graduate plans prior to graduation (Employment or graduate school):
- **5** students took full-time jobs in the public education sector (Anna Harvey, Sarah Rose, Melissa Spengler, Avery Williamson, Carly Johnson)
- **0** students took full-time jobs in the private education sector

- 1 student was accepted to the Japan Exchange and Teaching Program (Rachel McCann)
- 1 student was accepted to graduate programs (Ashley Lieber)
- 1 student is pending on graduate programs (Alexzandra Washington)
- 4 students are pursuing teacher licensure after graduation

III. Any changes to certificate/minor/licensure made on the basis of the assessment and analysis

- To introduce STEM majors to the STEM Education Minor and the Certificate of Proficiency, the course STEM 2003: The Art of STEM Communication was developed to be the Gateway course that fulfills a course requirement in both programs. It also fulfills a social science requirement for Goal 1 – Learning Outcome 1.2 and Goal 3 – Learning Outcome 3.3. In Fall 2021, one section of the course was offered with 21 students completing. In Spring 2022, two sections were offered with 38 students completing. Three sections will be offered in Fall 2022.
- STEM Ed Minor: The option was added to include ARSC 1201/1212 as an elective option if students took STEM 2003 as their entry course for the minor. Program change was approved.
- Teaching Licensure: All five licensure areas went through the ADE/DESE approval process to update to the most current state competencies, to add the 3-credit hour Teaching Seminar course to the internship semester, and to remove the CIED 4023 requirement. The state approved all program changes in February 2022.

IV. Any changes to the assessment process made or planned.

- ILLPA: Will revise assessment analysis assignment substantially to be more meaningful (and less stressful) to interns during their internship.
- Summative:
 1. We will place focused attention on TESS Domains 1 and 4 beginning earlier in the semester and continue the focus throughout. The final summative score on Domains 1 and 4 will be based on semester-long experiences rather than a final lesson observation.
 2. Will create a new “bucket list” type assignment to ensure students step out of their comfort zones and do *more* than their mentors promote them doing (i.e. contact parents multiple times, attend extracurricular events, do a professional presentation etc.). They need additional empowerment to overcome classroom culture limitations.

V. STEM Education Minor: Program Goals and Objectives

- To attract STEM majors to delve into the topic of STEM education and develop communication skills that will be beneficial to any career, even if they are not interested in becoming teachers.
- To increase the pool of potential teachers of STEM subjects to help address the critical shortage of teachers in math, science, and computer science at the secondary level.
- To increase enrollment in the STEM education (former UAteach) courses to keep them viable and offered on a regular basis to ensure that the University of Arkansas will be able to continue to prepare math, science, and computer science teachers at the secondary level.

VI. STEM Education Minor: Student Learning Outcomes

- Students who earn this minor in STEM Education will improve their ability to communicate STEM topics such as math and science to others.
- Students who earn this minor in STEM Education will have a deeper understanding of how people learn math, science, and computer science.
- Students who earn this minor in STEM Education will be able to teach STEM topics in a way that engages a class or other audience, using research-based strategies.
- Students who earn this minor in STEM Education will have an opportunity to explore their interests by choosing two elective courses relating to STEM education.
- Students who earn this minor in STEM Education will earn 15 credit hours in STEM education courses that can be applied to the teacher licensure program for Math, Biology, Chemistry, Physics, or Computer Science if they decide to become teachers

VII. STEM Education Certificate of Proficiency: Program Goals and Objectives

- To attract STEM majors to explore issues in STEM literacy and develop communication strategies from the field of education that will be beneficial to any STEM-related career.
- To increase the pool of potential teachers of STEM subjects to help address the critical shortage of teachers in math, science, and computer science at the secondary level.
- To increase enrollment in the STEM education (former UAteach) courses to keep them viable and offered on a regular basis to ensure that the University of

Arkansas will be able to continue to prepare math, science, and computer science teachers at the secondary level.

VIII. STEM Education Certificate of Proficiency: Learning Outcomes

- Students who earn this certificate in STEM Education will improve their ability to communicate STEM concepts from fields such as science, engineering, medical professions, mathematics
- Students who earn this certificate in STEM Education will be able to explain STEM topics in a way that engages a class or other audience, using research-based strategies.
- Students who earn this certificate in STEM Education will have a deeper understanding of how people learn math, science, and computer science.
- Students who earn this certificate in STEM Education will have an opportunity to explore their interests by choosing three elective courses relating to STEM education.
- Students who earn this certificate in STEM Education can apply up to 9 hours that will transfer to the Minor in STEM Education.
- To earn the Minor in STEM Education, students will earn 15 credit hours in STEM education courses that can be applied to the teacher licensure program for Math, Biology, Chemistry, Physics, or Computer Science if they decide to become teachers.

IX. Process for Assessing each Student Learning Outcome

- Timeline for assessment and analysis
 - a) Every May
- Means of assessment and desired level of student achievement
 - a. STEM Ed Certificate: students will complete 9 credit hours (from the approved course list) in order to receive the STEM Education Certificate
 - b. STEM Ed Minor:
 - i. Students will complete 15 hours from the designated list of courses with a 3.0 GPA.
 - ii. Teacher Licensure:
 - 1. *Summative Assessment*: All students will achieve a score of 2 (progressing) or more on the TESS evaluation system.
 - 2. *EDA*: All students will demonstrate *developing (1)* educator dispositions at minimum; most students will *meet expectations (2)*.
 - 3. *ILLPA*: All students will score progressing or better on their assessment analysis (pre/post) assignment.

4. *GPA*: Students must complete the program of studies with a GPA of 2.75 or better (or have faculty approval for exceptions)
- Reporting of results
 - CIED Head and Dean of COEHP

X. Undergraduate Secondary STEM Education: Program Conclusion

- The main program goals of the secondary STEM for the 2021-2022 academic year were:
 1. A successful implementation and enrollment of students in the new gateway course STEM 2003: The Art of STEM Communication.
 2. Students applying for and completing the new STEM Education Certificate of Proficiency.
 3. These goals were achieved because 59 students completed the newly introduced STEM 2003: The Art of STEM Communication course and 2 students completed the STEM Education Certificate of Proficiency.