

# **STEM Education for K-6 Graduate Certificate (STEMGC)**

**2020-2021**

## **Annual Academic Assessment Report**

The mission of the Integrated K-6 STEM Education Certificate program at the University of Arkansas is to provide future elementary teachers with the knowledge, skills, aptitudes, and tools necessary to make positive and lasting differences in the lives of their current and future students. We believe in providing a creative, and critical-thinking environment, where engaging STEM (Science, Technology, Engineering, and Math) content is the foundation and learning is delivered through real-world connections, problem/project-based learning, and performance-based assessment. The ultimate goal of the program is to nurture STEM confidence, the ability to deliver engaging STEM curriculum, as well as a passion for STEM learning among elementary teacher education candidates and practicing teachers.

### **Results of analysis of assessment of candidate learning**

Each spring semester, candidates who are completing the STEMGC are asked to complete the STEM Graduate Certificate Exit Survey (see attached instrument). This instrument provides an assessment of candidate aptitudes, skills, practices and beliefs related to the graduate certificate program. Notably, most negative responses to the 2021 Exit Survey were related to the COVID-19 mandates and restrictions. Due to the fact that all courses associated with the STEMGC include vast amounts of project-based instructional strategies and collaborative teaching techniques, the candidates expressed concerns about how these teaching techniques are carried out during times when student contact is extremely limited. In general, the exiting candidates were very pleased with the program and the learning experiences they received within the program.

### **Any changes to degree/certificate planned or made on the basis of the assessment and analysis**

During 2020 – 2021, we experimented with several instructional strategies that allowed course participants to complete project-based learning experiences and collaborative learning experiences utilizing immediate family members as teammates and colleagues, rather than using classmates as teammates. These experiments were very well received by students in the courses and many of them utilized these instructional strategies with their own K-6 students. These adaptations and other minor changes were made in some courses.

### **Planned changes to the STEMGC.**

Since the required implementation of graduate and undergraduate versions of the first two courses (STEM 4033 and STEM 5023) we continue to have some difficulty with the Graduate School recognizing these two courses as requirements of the certificate program during degree

audits. We will meet with representatives of the Graduate School during 2021 to develop a plan to alleviate such problems in future years.

**Timeline for assessment and analysis**

Key assessments are collected throughout coursework and analyzed by course instructor. Student knowledge of key competencies are evaluated at during monthly meetings of the core STEM faculty.

**Means of assessment and desired level of student achievement**

Key assessments in courses are collected and evaluated during key courses across all certificate coursework.

**Reporting of results**

Evaluations are conducted of student knowledge of STEM teaching and learning strategies, engagement in collaboration, project-based learning, and interdisciplinary learning within individual courses. These results are reported at monthly meetings of the core STEM faculty.

### STEM Graduate Certificate Exit Survey 2021

Directions: This questionnaire will help us gain a better understanding of your educational preparation. Please indicate the degree to which the following experiences helped prepare you to teach STEM. Your answers are confidential.	Not Influential	(2)	Influential	(4)	Very Influential
1. How influential was STEM 4033: <u>Introduction to Integrated STEM</u> on your ability to teach STEM	(1)	)	(3)	)	(5)
2. How influential was STEM 5023: <u>Creativity and Innovation</u> on your ability to teach STEM	(1)	)	(3)	)	(5)
3. How influential was STEM 5203: <u>Problem-based Mathematics</u> on your ability to teach STEM	(1)	)	(3)	)	(5)
4. How influential was STEM 5213: <u>Problem-based Science</u> on your ability to teach STEM	(1)	)	(3)	)	(5)
5. How influential was CIED 5032: <u>Curriculum Design Concepts for Teachers</u> on your ability to develop STEM curriculum	(1)	)	(3)	)	(5)
6. How influential was the internship experience on your ability to teach STEM	(1)	)	(3)	)	(5)
7. How influential were <u>hands-on learning</u> experiences in the STEM lab	(1)	)	(3)	)	(5)
8. How influential were <u>theory-based learning</u> experiences in various STEM courses	(1)	)	(3)	)	(5)
9. How influential was attendance and/or presentations at professional conferences (i.e., ISEA, NASA, etc.) <b>Skip if not applicable</b>	(1)	)	(3)	)	(5)
10. How influential were volunteer STEM teaching experiences with students at local schools (STEM nights, afterschool clubs) <b>Skip if not applicable</b>	(1)	)	(3)	)	(5)
11. How influential were volunteer STEM experiences at special events on campus (i.e., Razorback STEM Challenge, etc.) <b>Skip if not applicable</b>	(1)	)	(3)	)	(5)
12. How influential were STEM teaching experiences with your mentor teacher during the internship. <b>Skip if not applicable/didn't teach any STEM</b>	(1)	)	(3)	)	(5)
13. How influential were STEM curriculum development experiences in various STEM courses	(1)	)	(3)	)	(5)
14. How much did the STEM graduate certificate (STEMGC) program influence your ability/willingness to teach more <u>science</u> in the elementary school	(1)	)	(3)	)	(5)
15. How much did the STEMGC program influence your ability/willingness to teach more <u>technology</u> in the elementary school	(1)	)	(3)	)	(5)
16. How much did the STEMGC program influence your ability/willingness to teach more <u>engineering</u> in the elementary school	(1)	)	(3)	)	(5)
17. How much did the STEMGC program influence your ability/willingness to teach more <u>mathematics</u> in the elementary school	(1)	)	(3)	)	(5)
18. How much did the STEMGC influence you to consider additional education or degrees in STEM (i.e., Ed. Specialist, Ph.D., other grad program)	(1)	)	(3)	)	(5)
19. How much did the STEMGC influence you to seek future STEM leadership opportunities (i.e., elementary school STEM director, etc.)	(1)	)	(3)	)	(5)

**Please provide a brief written response to the following questions:**

20. Which STEM course/teacher most influenced your development as a STEM teacher/why?

21. Which STEM course/teacher was least helpful/why? What change should be made?

22. Please describe any other person or experience that was influential: