Graduate Certificate in K-8 Integrated STEM Education

v 2 Graduate Certificate Create 2019-20

I. General Information

Select *Program* below.

Type of Program* (•) Program ( ) Shared Core

Read before you begin

TURN ON help text before starting this proposal by clicking in the top right corner of the heading. You will need to turn on help text again after any actions that refresh the page including after saving proposals, importing information, or running impact reports.

FILL IN all fields required marked with an *. You will not be able to launch the proposal without completing required fields

LAUNCH proposal by clicking in the top left corner.

Finish the launch of your proposal by clicking the icon located in the Proposal Toolbox on left side at top. Make your decision, comment is optional, and click on "Make decision".

You can check the status of the proposal by clicking in Proposal Toolbox to verify that the proposal has gone to the next step.

College/ Department* Teaching and Learning

Degree Type* Graduate and Advanced Graduate Certificate

Program Type* Certificate

Program Title* Graduate Certificate in K-8 Integrated STEM Education

Total Required Credits* 12

Term of First Enrollment* Fall 2020

Graduate Coordinator for Micah Stohlmann

Proposed Certificate*

Certificate Type* (•) Graduate (minimum bachelor's degree required for admission)
( ) Graduate Advanced (minimum master's degree required for admission)

Instructional Mode* (•) In person only
( ) Web-based only (all courses offered online)
( ) Hybrid (50% or more courses offered online)

Typical Time to Degree* 1 year

Admission Term Deadlines:

Deadlines for each semester must be on or before: Fall - August 1st, Spring - December 1st, Summer - May 1st

Admission Terms* [x] Fall
[x] Spring
[x] Summer

Application Deadline(s)* Fall: June 1st, Spring, November 1st, Summer, March 15th

II. Certificate Information

Required Additional Documents

a. **Certificate Financial Aid Reporting Form – Available on the Graduate Curriculum page**
b. **Three Year Academic Assessment Plan – Available from UNLV Office of Academic Assessment**
c. **Two (2) letters of support**
   i. **Chair/Director of the academic unit that will offer the certificate**
   ii. **Academic Dean**

   Each letter must verify that the proposed certificate has received faculty approval through the appropriate governance procedures, as well as the existence of necessary resources to support the Certificate as presented in the proposal.

d. **Five Representative Course Syllabi (for certificates with fewer than 5 courses, provide all course syllabi)**

Documents Required for Submission to be Complete

- [x] Certificate Financial Aid Reporting Form – Available on the Graduate Curriculum page
- [x] Three Year Academic Assessment Plan – Available from UNLV Office of Academic Assessment
- [x] Two (2) letters of support
- [x] Five Representative Course Syllabi (for certificates with fewer than 5 courses, provide all course syllabi)

Executive summary describing the proposed certificate program*

The Graduate Certificate in K-8 Integrated STEM Education is designed for individuals in pursuit of professional advancement in the field of STEM Education at the K-8 level. The Graduate Certificate in K-8 Integrated STEM Education requires the completion of four 3 credit hour classes: CIE 621, CIE 631, CIE 633, and CIE 634.

The certificate will enable students to advance in their knowledge of methods for integrating STEM subjects, curriculum available for STEM integration, research done on integrated STEM education, and content knowledge of mathematics and science needed to effectively facilitated integrated STEM education learning.

Explanation of how the proposed certificate is related to existing undergraduate and/or graduate programs, and how this certificate will provide knowledge and skills not already available to current or potential UNLV students.*

Current courses for undergraduate teacher education students and graduate education students are subject specific. This certificate will focus on the necessary knowledge bases for integrating the STEM subjects. An emphasis area for K-8 Integrated STEM Education in the Curriculum and Instruction-Master of Science program is going through the approval process. The courses for this certificate are part of the program for the new K-8 STEM Education subplan.

A statement describing the profile of potential certificate students and market demand for the certificate program, including, related occupations, job placement opportunities and market trend data when available.*

One of the targeted priorities of the Clark County School District is furthering the effective instruction of STEM Education. In addition, there are elementary and middle schools in the district, state, and nation that have adopted a STEM education focus. Research and interest in STEM education has been increasing. The new state science standards have a focus on integration of subjects. Research publications highlighting the benefits of integrated STEM education have been increasing as well as national and state level grant funding.

Once approved, the Graduate Certificate in K-8 Integrated STEM Education will become an immediate pathway for educator professionals opting to pursue this professional development opportunity. The certification program will provide students with the knowledge and skills to effectively meet the needs of diverse K-8 students.

Description of the academic unit's

All of the course descriptions and syllabus included in the proposed Graduate

capability for offering this certificate; **including administration of the program, faculty resources and expertise, and other required resources.***	Certificate in K-8 Integrated STEM Education are attached. The courses will be taught on a regular basis in the Department of Teaching and Learning. The responsibility for teaching theses courses will be done by 3 science education faculty and one math education faculty.

Description of the administration of the certificate, including

Number of students anticipated to be enrolled and strategies for recruitment:	In the initial phase, we hope to enroll 15 to 20 students during the first year of operation. Students will apply for admission to the Graduate College via the online application portal. Once admitted to the certificate program, students will be asked to contact the STEM education program coordinator to schedule a meeting regarding the certificate requirements. Students will be recruited to the certificate program by placing an announcement about the certificate on the UNLV Today listserv and CCSD email lists. Information about the certificate will be added to the appropriate area of the Graduate College and Teaching and Learning website. The program will also be promoted via word of mouth by certificate-involved faculty and students.
Submission of new courses (if necessary for certificate program) to the Graduate Course Review Committee.	Four new courses are in the approval process for the Graduate Certificate in K-8 Integrated STEM Education. The certificate program of study is comprised of four new courses in the Teaching and Learning department.
A detailed budget for the establishment and administration of proposed certificate program, including acknowledgement of what additional resources (if any) are required in order to offer proposed certificate.	No additional funding is necessary. Faculty in mathematics education and science education in the Teaching and Learning department where the certificate will be housed will manage applications and hold meetings with interested students.
Description of any accreditation requirements, off-campus partnerships or other details involving campus-wide and/or	None.

external partnerships or affiliations.	

Student Authentication – Federal guidelines require that distance education and correspondence programs utilize mechanisms that verify student identity. UNLV strives to insure that this is done with all programs, not just those delivered via distance education. Describe how this program will verify student identity. (for more information on student authentication see the UNLV Office of Online Education and WICHE)

Describe how this program will verify student identity*	The courses for this certificate will be offered in-person with the use of the Webcampus platform as well. The WebCampus platform requires all users to authenticate with their username and password before they can access the course. The WebCampus platform provides secure and password-protected environment for both instructors and students. In addition, all of the courses will mplement authentic assessments that reflect students' original and critical thinking and learning experience, which enhances the policy of academic honesty.

Learning Outcomes*	**Student Learning Outcomes** Students will be able to 1. Integrate knowledge of **mathematical content** into effective integrated STEM lessons. 2. Integrate knowledge of **science content** into effective integrated STEM lessons. 3. Discuss **trends and issues** in integrated STEM education. 4. Explain how K-8 students **learn and think** mathematically and scientifically and analyze the **psychological and sociological influences** on students. 5. Create an integrated STEM lesson plan with a focus on **engineering design**, **mathematical modeling,** and **technology integration**. 6. Create **effective integrated STEM lessons** that respect the diversity of backgrounds in a classroom. 7. Demonstrate application of the **materials and resources** available for implementing a standards-based approach to the teaching and learning of STEM education. 8. Synthesize **research and application literature** to demonstrate conceptual mathematical understanding. 9. Synthesize **research and application literature** to demonstrate conceptual science understanding. 10. Synthesize K-8 STEM Education **theoretical research and application literature** into models of effective STEM education teaching. 11. Describe and analyze the current **K-8 STEM Education Curriculum** 12. Describe and analyze the current **K-8 STEM Education Standards** in the United States 13. **Analyze** the components of K-8 STEM Education Programs. 14. Demonstrate the ability to **conduct action research** on STEM Education

Graduate Catalog text (for reference)

Follow these steps to build the new certificate curriculum:

Step1

Click on "View Curriculum Schema." Click 'Add Core' and name your core (please use a comparable degree program in the current graduate catalog as a template). Add any descriptive text (do not add courses until Step 2). Descriptive text is generally used in the following cores: Plan Description, Plan Admission Requirements, Plan Requirements, Plan Certificate Completion Requirements.

Step 2

There are two options for adding courses: "Add Course" and "Import Course." For courses already in the catalog, click on "Import Course" and find the courses needed. For new classes going through a Curriculog Approval Process click on "Add Course"-- a box will open asking you for the Prefix, Course Number and Course Title.

Step 3

Click on "View Curriculum Schema." Click on the area/header of the program where you would like to add courses. When you click on "Add Courses" it will bring up the list of courses available from Step 2. Select the courses you wish to add. For removing courses click on the and proceed.

Prospective Curriculum*

Plan Description

The Graduate Certificate in K-8 Integrated STEM Education is designed for individuals in pursuit of professional advancement in the field of STEM Education at the K-8 level. The certificate enables students to advance in their knowledge of methods for integrating STEM subjects, curriculum available for STEM integration, research done on integrated STEM education, and content knowledge of mathematics and science needed to effectively facilitate integrated STEM education learning.

Plan Admission Requirements

All applicants must review and follow the Graduate College Admission and Registration Requirements, and provide evidence of a standard teaching license.

Plan Requirements

Total Credits Required-12

Course Requirements

Required Courses-Credits: 12

CIE 621 Integrated STEM education mathematics content
CIE 631 Integrated STEM education science content
CIE 633 Integrated STEM education methods
CIE 634 Integrated STEM education curriculum and research

Certificate Requirements

Students must earn a cumulative GPA of 3.0 or higher from all courses for the certificate.

Certificate Completion Requirements

The student must submit all required forms to the Graduate College and then apply for graduation in MyUNLV by the appropriate deadline.

The Degrees Directory provides current and consistent degree information. Submission of this form indicates acknowledgement and understanding that every department is responsible for creating and maintaining accurate and updated program information on the UNLV Degrees Directory.

Degrees Directory Program Entry ☑ Check this box to acknowledge the above statement.

Sample program of study*

Fall Semester:

CIE 631 Integrated STEM education science content.

Spring Semester

CIE 634 Integrated STEM education curriculum and research.

Summer Semester

CIE 621 Integrated STEM education mathematics content.

CIE 633 Integrated STEM education methods.

III. Department Vote Information

Date faculty voted on proposal	2-20-19
Result of vote	13-0-0
Manner of vote	in-person

IV. Unit Vote Information

Date faculty voted on proposal	10/28/2019
Result of vote	8/8
Manner of vote	person

V. Graduate College Use Only

Program Alerts (E.g. **View Program Disclaimer)**	
Processing Notes	
Acalog Processing Date	**Initials**

VI. Registrar Use Only

Processing Notes	
PS Processing Date	**Initials**