Graduate Studies General Syllabus

MECI 5123 Teaching and Learning in STEAM Education

Credit Hours: 3   Lecture Hours: 3   Laboratory Hours: 0

Prerequisites: Admission to the M.Ed. program

Effective Catalog: 2019-2020

I.   Graduate Course Information

A. Catalog Description
Introduces rationale for and methods of integrating science, technology, engineering, arts, and math through project-based learning, arts integration, collaboration, and multidimensional approaches to assessment. Examines the current job market in STEAM education.

B.   Additional Information
STEAM education is a contextual curriculum where the subjects of science, technology, engineering, mathematics and the broad spectrum of the arts all relate to each other in reality. This course seeks to inform students on how to integrate and support each discipline under a formal educational structure and not only integrate the art of aesthetics and design, but also the divisions of the liberal, language, musical, physical and manual arts in relation to STEM education.

II.   Student Learning Outcomes

A. Subject Matter
Upon successful completion of this graduate course, the student will be able to:

1. Define what is meant by STEAM education and describe how it can be integrated in a school's curriculum.
2. Explain the epistemology and pedagogy of the STEM/STEAM curriculum in light of research findings.
3. Explore and evaluate classroom management strategies (behavioral and interdisciplinary) that are conducive to a project-based learning environment in which all students are engaged and on task.
4. Explain the reasoning for and how to create STEAM Teams for educators and students.

5. Create a STEAM unit of study which includes multidimensional approaches to assessment based on Next Generation Science Standards (NGSS) and Common Core State Standards (CCSS).
6. Analyze and interpret data from varied multidimensional assessments used in project-based learning in order to inform decision making and report progress of students to parents.
7. Research several of the common themes in STEAM education and choose one from which to create a unit
8. Conduct interviews and observations with teachers, administrators, and/or curriculum coordinators to gather diverse perspectives of STEAM education implementation.
9. Lead a professional learning community on the topic of STEAM education and summarize strategies that can be used in the classroom and opportunities that can be created to involve diverse families and local/global communities.
10. Explore career opportunities in the area of STEAM education and explain how/why all classroom teachers should be informed.

B. Program Learning Outcomes (PLO)

The M.Ed. program bases Program Learning Outcomes on the National Board for Professional Teaching Standards (NBPTS). The NBPTS establishes and upholds rigorous expectations for what expert teachers should know and do. This graduate course enhances student abilities in the following areas:

Commitment: Teachers believe that all students can learn and meet high expectations. Teachers are committed to all learners and are passionate about teaching. They develop relationships with students in a variety of educational settings. Teachers create learning experiences that differentiate instruction to meet the needs of all students. They understand their subjects and how to teach those subjects to students.

Responsibility: Teachers facilitate and supervise student learning. Teachers embrace a variety of methods to increase student success. They establish social norms within a variety of dynamic grouping options. They motivate and engage students while assessing student performance.

Systematic Thinking: Teachers critique their practices and learn from experience. Teachers evaluate their practices and expand their learning based on best practices, current research, evolving technologies, and student data.

Leadership: Teachers demonstrate leadership that fosters excellence, effectiveness, and collaboration with colleagues, families, and the community. Teachers approach their work with a team mentality. They collaborate with all stakeholders sharing vital information and planning a course of action that will

improve the effectiveness of the school.

III. Major Graduate Course Topics

A. Defining STEAM Education
B. Classroom Management in a Student-Centered Environment
C. Creating Teams in STEAM Education
D. Standards-Based STEAM Units with Multidimensional Assessments
E. Using Data to Inform Decision Making
F. Professional Learning Communities and STEAM
G. Career Opportunities in STEAM Education