STEM Education (STEM)

Courses

STEM 2003. The Art of STEM Communication. 3 Hours.
It is widely known that breakdown of communication contributes to mistrust and misunderstanding of the scientific enterprise. In this dynamic, interdisciplinary course including guest lectures, socio-scientific issues, and theatre-style methods, students will learn to communicate complex STEM topics clearly and effectively using research-based practices from the field of education. (Typically offered: Fall and Spring)

STEM 2103. Knowing and Learning in Science and Mathematics. 3 Hours.
This course examines theories of learning to provide a firm foundation for teaching, learning, and communicating within STEM disciplines. Drawing from scholarship in educational psychology and other disciplines, students explore implications for designing effective learning environments, the relationship between communication and learning, and how learning is influenced by culture. (Typically offered: Fall)

STEM 3203. Classroom Interactions. 3 Hours.
This course examines the interaction between teachers, students, and content, and how effective communication and pedagogical knowledge contribute to development of conceptual understanding of STEM subjects. Students learn a variety of lesson planning and instructional strategies to engage students of diverse backgrounds and implement in a high school practicum. Prerequisite: STEM 2103. (Typically offered: Fall and Spring)

STEM 3303. Project Based Instruction for Secondary Mathematics and Science. 3 Hours.
This teacher preparation course focuses on the integration of mathematics and science concepts in project-based lessons to model ways used by scientists, mathematicians, and engineers in addressing real-world problems. Each student team will design and teach a project-based unit and evaluate its effectiveness in a secondary classroom. Prerequisite: STEM 2203 or instructor consent. (Typically offered: Fall)

STEM 4033. Introduction to STEM Education. 3 Hours.
This course provides an introduction to the foundations of STEM education disciplines and the strategies used to deliver integrative STEM education in the elementary and secondary school setting. The nature of STEM education disciplines, STEM pedagogy, teaching strategies, integrative STEM learning, STEM careers, and problem-centered instruction are addressed. (Typically offered: Spring and Summer)

STEM 4043. Creativity and Innovation in STEM Education. 3 Hours.
This course in technology and engineering education focuses on the development and introduction of TEED activities to support science and mathematics instruction in the elementary classroom. Through hands-on, problem-based learning challenges, students will develop and understand the engineering design process and the integration of STEM often used to solve real-world problems. Prerequisite: STEM 4033 or STEM 5033 (formerly STEM 4033). (Typically offered: Fall and Summer)

STEM 4333. History and Philosophy of Science for Science Teachers. 3 Hours.
The History and Philosophy of Science for Science Teachers explores knowledge generation in the sciences by referencing the history and philosophy of the sciences. The course prepares future teachers with the background, rationales and strategies necessary to enhance student knowledge and interest in these important foundation areas. (Typically offered: Spring)

STEM 4506. Supervised Clinical Teaching Internship. 6 Hours.
Supervised Clinical Teaching is the apprenticeship experience for students preparing for careers as mathematics, science, and computer science teachers. Teacher interns will teach at the secondary level with mentoring provided by university supervisors and experienced classroom educators. A required weekly seminar will address experiences, questions and problems encountered in the field. Prerequisite: SEED 4003 or SEED 4303 or CATE 4073. (Typically offered: Fall and Spring)

STEM 5023. Creativity and Innovation in STEM. 3 Hours.
This introductory course in technology and engineering education (TEED) focuses on the development and introduction of TEED activities to support science and mathematics instruction in the elementary classroom. Through hands-on, problem-based learning challenges, students will develop and understanding of the engineering design process and the integration of STEM often used to solve real-world problems. Prerequisite: STEM 4033 or STEM 5033 (formerly STEM 4033). (Typically offered: Fall and Summer)

STEM 5033. Introduction to STEM Education. 3 Hours.
(Formerly STEM 4303.) This course provides an introduction to the foundations of STEM education disciplines and the strategies used to deliver integrative STEM education in the elementary and secondary school setting. The nature of STEM education disciplines, STEM pedagogy, teaching strategies, integrative STEM learning, STEM careers, and problem-centered instruction are addressed. Graduate degree credit will not be given for both STEM 4303 and STEM 5033. (Typically offered: Spring and Summer)

STEM 5104. Supervised Clinical Teaching Internship. 6 Hours.
(Formerly STEM 4504.) This course is designed to introduce students to the development and implementation of integrative STEM education in the elementary and secondary school setting. The nature of STEM education disciplines, STEM pedagogy, teaching strategies, integrative STEM learning, STEM careers, and problem-centered instruction are addressed. Graduate degree credit will not be given for both STEM 4504 and STEM 5104. (Typically offered: Fall and Summer)

STEM 5203. Problem-Based Mathematics. 3 Hours.
This graduate level course focuses on sharing, modeling and practicing strategies to support the meaningful integration of science, technology, engineering and mathematics (STEM) with the emphasis on mathematics in the K-4 classroom. A strong foundation for integrating the STEM disciplines through a problem-based approach within the elementary curriculum will be developed by providing students with theoretical frameworks, research, resources, and methods related to appropriate and effective classroom practice. Prerequisite: CIED 3123. (Typically offered: Fall and Spring)
STEM 5213. Teaching Problem-Based Science in the Elementary Grades. 3 Hours.
This graduate level course focuses on sharing, modeling and practicing strategies to support the meaningful integration of science, technology, engineering and mathematics (STEM) with the emphasis on science in the K-4 classroom. A strong foundation for integrating the STEM disciplines through a problems-based approach within the elementary curriculum will be developed by providing students with theoretical frameworks, research, resources, and methods related to appropriate and effective classroom practice. Prerequisite: CIED 3143 and admission to either Elementary Education (ELEDMA) or Curriculum and Instruction (CIEDME) program. (Typically offered: Spring)