Education-Sci, Tech, Engineering, Math (ESTM)

Courses

ESTM 510. Foundations of STEM Education. 4 Units.
Overview of philosophy, perspectives, and standards of Science, Technology, Engineering, and Mathematics (STEM) education that contribute to an integrated view of STEM education.

ESTM 511. Technology and Engineering Design in STEM Education. 4 Units.
Prerequisites: ESTM 510 or consent of instructor
Examination of the technology and engineering design process models that result in effective Science, Technology, Engineering and Mathematics (STEM) Education.

ESTM 512. Foundations of Research in STEM Education. 4 Units.
Prerequisites: ESTM 510 and 511 or consent of program coordinator
Fundamentals of planning, designing, and conducting a research study. Will emphasize research methods including qualitative and quantitative in Science, Technology, Engineering, and Mathematics (STEM) education, frame research questions, review literature and library resources, and include descriptive and inferential statistics.

ESTM 514. STEM Education: Technology Tools. 4 Units.
Prerequisites: ESTM 510
Introduction to various technology tools useful for use in STEM education. (4 units.

ESTM 535. STEM Education: Exploration of Technology. 4 Units.
Prerequisites: ESTM 510 or consent of coordinator
Use of technology and technological systems for the understanding of the relationship between natural and human-made world.

ESTM 548. STEM Education: Green Technology. 4 Units.
Prerequisites: ESTM 510 or consent of instructor
Green technology with an emphasis in wind turbines, hydroelectric power, bio-fuels, environmental monitoring solar power, fuel cells, green construction, other related technologies and career paths.

ESTM 613. Assessment in Stem Education. 4 Units.
Prerequisites: ESTM 510 or consent of program coordinator
Assessment principles and techniques in STEM classrooms or workforce development/training with a focus on developing and using assessment instruments resulting in valid and reliable information for and of learning.

ESTM 624. Teaching Elementary Mathematics in STEM Education. 4 Units.
Prerequisites: ESTM 510, ESTM 511, MATH 115 or equivalent, MATH 301A, MATH 301B, MATH 301C, and MATH 308 or consent of program coordinator
Advanced models for mathematics teaching and learning in elementary schools, including how students learn mathematics, and technology and resources to facilitate mathematics learning.

ESTM 625. Teaching Algebra in STEM Education. 4 Units.
Prerequisites: ESTM 510, ESTM 511, and ESTM 624 or consent of program coordinator
Topics building on college algebra courses, methods of teaching algebraic skills, procedures and concepts, and technology and resources to facilitate algebra learning.

ESTM 626. Teaching Geometry in STEM Education. 4 Units.
Prerequisites: ESTM 510, ESTM 511, ESTM 624 and ESTM 625 or consent of program coordinator
Topics in Euclidean and non-Euclidean geometry. Technology and resources to facilitate geometry learning and fostering geometric thinking among K-8 students.

ESTM 628. The Integrated STEM Curriculum. 4 Units.
Prerequisites: ESTM 510, ESTM 623, ESTM 624, ESTM 625, and ESTM 626 or consent of program coordinator
Cumulating course in the STEM education program that examines the development of integrated STEM education curricular units.

ESTM 634. Research in STEM Education. 4 Units.
Prerequisites: ESTM 510 or consent of the instructor
Focus on advanced research and implications on STEM Education.

ESTM 644. Inquiry in STEM Education. 4 Units.
Examine, develop and apply strategies for inquiry teaching and learning in STEM Education.

ESTM 647. Teaching Earth/Space Science in STEM Education. 4 Units.
Examine develop and apply earth science and space science teaching and learning reflected through STEM Education.

ESTM 648. Teaching Life Science in STEM Education. 4 Units.
Examine, develop and apply life science teaching and learning reflected through STEM Education.

ESTM 680. STEM Education: Integration Seminar I. 4 Units.
Prerequisites: ESTM 510 or consent of program coordinator
Interdisciplinary discussion of Science, Technology, Engineering, and Mathematics (STEM) education topics and issues, presentation of STEM projects.
ESTM 681. STEM Education: Integration Seminar II. 4 Units.
Prerequisites: ESTM 510 and ESTM 680 or consent of program coordinator
Leadership development, utilizing a cross-disciplinary approach in Science, Technology, Engineering, and Mathematics (STEM) education requiring presentations and leading discussions in STEM related projects.

ESTM 690. STEM Education: Advanced Research. 4 Units.
Prerequisites: ESTM 510, 511, and 512 or consent of program coordinator
Advanced techniques in both quantitative and qualitative research methods, introduction to regression analysis, Excel spreadsheets, and SPSS conducting research in Science, Technology, Engineering, and Mathematics (STEM) education. Provides students with the knowledge and skills to complete their own research work. (4 units).

ESTM 692. STEM Education: Service Learning Fieldwork. 4 Units.
Prerequisites: ESTM 613 or consent of program coordinator
Application of STEM education in field settings. Service learning in an educational setting - e.g., K-12, continuing education, professional development, and adult education. Requires a written agreement with a sponsoring agency and departmental approval of that agreement.

ESTM 698A. Continuous Enrollment for Graduate Candidacy Standing. 1 Unit.
Prerequisites: advancement to candidacy and approval of program graduate coordinator or, if an interdisciplinary studies major, consent of the Dean of Graduate Studies
Independent study leading to completion of requirements (other than course work) for the master's degree. To retain classified standing in the master's program, a student must enroll in 698 each quarter until the project or thesis is accepted or the comprehensive examination passed. Students who enroll in 698 through the university have full use of all university facilities. See Culminating Experience: Exam, Thesis, or Project in Graduate Degree and Program Requirements section of the Bulletin of Courses. 698 is a variable unit course, see fee schedule in the Financial Information section of the Bulletin of Courses. Earned units are not degree-applicable nor will they qualify for financial aid.

ESTM 698B. Continuous Enrollment for Graduate Candidacy Standing. 2 Units.
Prerequisites: advancement to candidacy and approval of program graduate coordinator or, if an interdisciplinary studies major, consent of the Dean of Graduate Studies
Independent study leading to completion of requirements (other than course work) for the master's degree. To retain classified standing in the master's program, a student must enroll in 698 each quarter until the project or thesis is accepted or the comprehensive examination passed. Students who enroll in 698 through the university have full use of all university facilities. See Culminating Experience: Exam, Thesis, or Project in Graduate Degree and Program Requirements section of the Bulletin of Courses. 698 is a variable unit course, see fee schedule in the Financial Information section of the Bulletin of Courses. Earned units are not degree-applicable nor will they qualify for financial aid.

ESTM 698C. Continuous Enrollment for Graduate Candidacy Standing. 3 Units.
Prerequisites: advancement to candidacy and approval of program graduate coordinator or, if an interdisciplinary studies major, consent of the Dean of Graduate Studies
Independent study leading to completion of requirements (other than course work) for the master's degree. To retain classified standing in the master's program, a student must enroll in 698 each quarter until the project or thesis is accepted or the comprehensive examination passed. Students who enroll in 698 through the university have full use of all university facilities. See Culminating Experience: Exam, Thesis, or Project in Graduate Degree and Program Requirements section of the Bulletin of Courses. 698 is a variable unit course, see fee schedule in the Financial Information section of the Bulletin of Courses. Earned units are not degree-applicable nor will they qualify for financial aid.

ESTM 698D. Continuous Enrollment for Graduate Candidacy Standing. 4 Units.
Prerequisites: advancement to candidacy and approval of program graduate coordinator or, if an interdisciplinary studies major, consent of the Dean of Graduate Studies
Independent study leading to completion of requirements (other than course work) for the master's degree. To retain classified standing in the master's program, a student must enroll in 698 each quarter until the project or thesis is accepted or the comprehensive examination passed. Students who enroll in 698 through the university have full use of all university facilities. See Culminating Experience: Exam, Thesis, or Project in Graduate Degree and Program Requirements section of the Bulletin of Courses. 698 is a variable unit course, see fee schedule in the Financial Information section of the Bulletin of Courses. Earned units are not degree-applicable nor will they qualify for financial aid.

ESTM 698E. Continuous Enrollment for Graduate Candidacy Standing. 5 Units.
Prerequisites: advancement to candidacy and approval of program graduate coordinator or, if an interdisciplinary studies major, consent of the Dean of Graduate Studies
Independent study leading to completion of requirements (other than course work) for the master's degree. To retain classified standing in the master's program, a student must enroll in 698 each quarter until the project or thesis is accepted or the comprehensive examination passed. Students who enroll in 698 through the university have full use of all university facilities. See Culminating Experience: Exam, Thesis, or Project in Graduate Degree and Program Requirements section of the Bulletin of Courses. 698 is a variable unit course, see fee schedule in the Financial Information section of the Bulletin of Courses. Earned units are not degree-applicable nor will they qualify for financial aid.
ESTM 698F. Continuous Enrollment for Graduate Candidacy Standing. 6 Units.
Prerequisites: advancement to candidacy and approval of program graduate coordinator or, if an interdisciplinary studies major, consent of the Dean of Graduate Studies
Independent study leading to completion of requirements (other than course work) for the master's degree. To retain classified standing in the master's program, a student must enroll in 698 each quarter until the project or thesis is accepted or the comprehensive examination passed. Students who enroll in 698 through the university have full use of all university facilities. See Culminating Experience: Exam, Thesis, or Project in Graduate Degree and Program Requirements section of the Bulletin of Courses. 698 is a variable unit course, see fee schedule in the Financial Information section of the Bulletin of Courses. Earned units are not degree-applicable nor will they qualify for financial aid.

ESTM 698Z. Continuous Enrollment for Graduate Candidacy Standing. 0 Units.
Prerequisites: advancement to candidacy and approval of program graduate coordinator or, if an interdisciplinary studies major, consent of the Dean of Graduate Studies
Independent study leading to completion of requirements (other than course work) for the master's degree. To retain classified standing in the master's program, a student must enroll in 698 each quarter until the project or thesis is accepted or the comprehensive examination passed. Students who enroll in 698 through the university have full use of all university facilities. See Culminating Experience: Exam, Thesis, or Project in Graduate Degree and Program Requirements section of the Bulletin of Courses. 698 is a variable unit course, see fee schedule in the Financial Information section of the Bulletin of Courses. Earned units are not degree-applicable nor will they qualify for financial aid.

ESTM 699. STEM Education: Master's Thesis/Project. 4 Units.
Prerequisites: ESTM 690, advancement to candidacy, approval of thesis/project by the student's advisory committee
Independent graduate research or projects conducted under the direction of thesis or project committee.

ESTM 999. STEM Education: Comprehensive Examination. 0 Units.
Prerequisites: ESTM 680, completion of course work in the master's program, advanced to candidacy, approval of the department, and in good academic standing
Corequisites: ESTM 681
An assessment of the student's ability to integrate the knowledge of STEM education, show critical and independent thinking and demonstrate mastery of the subject matter.