

MSSE - Master of Science Education

MSSE 501 Inquiry Sci Eng Prac: 2 Credits (2 Lec)

(F, Sp) This course provides a focus on inquiry instruction through the use of Science and Engineering Practices for grade K to 16 teachers in science education. Students will identify the components of inquiry in the context of Science and Engineering Practices as described in the NRC Framework for K-12 Science Education. Course goals include development and implementation of inquiry-based instruction and classroom research; and increased understanding of the role of assessment in an inquiry-based science classroom. Offered Fall, Spring, Summer.

MSSE 502 Emerging Technology and the Science Classroom: 2 Credits (1 Lec, 1 Other)

(Su) This course introduces skills and techniques to deepen students' understanding of technology enriched instruction in the science classroom. Students in this course are practicing teachers of science. The focus is on emerging technology trends in the K-12 classroom with an emphasis on blended learning techniques, including flipped classrooms and gamification. Students will also explore how to use scientific data sets with their students. The assignments in this course are intended to be practical and have direct utility in the science classroom. Offered Summer.

MSSE 503 Integrating Literature into the Biology/Life Science Classroom: 3 Credits (1 Lec, 2 Other)

(Sp, Su) This course is designed for elementary, middle and high school teachers of biology/life science. The course provides effective strategies to integrate literature in the biology/life science classroom. Students will share cross-level instruction and constructive ideas with each other. The goal of this course is to engage and support the integration of reading and science instruction. Offered Spring.

MSSE 504 Formative Assess in Sci Ed: 3 Credits (2 Lec, 1 Other)

(F, Sp) Formative assessment is an ongoing process in education. This course will engage teachers in an ongoing discussion and study regarding the construction, selection and use of formative assessment methods. The teachers' own instructional settings (classrooms, museums, aquariums, outdoor schools, etc.) are used as "research bases" to conduct classroom assessment studies. The results of the assessments provide immediate feedback on both teacher effectiveness and student learning. Offered Fall and Spring.

MSSE 505 Foundations of AR in Sci Ed: 3 Credits (2 Lec, 1 Other)

(Sp) This course presents an overview of action research for practicing teachers and informal science educators. Students will explore the conceptual underpinnings of action research in science education as they relate specifically to curriculum, teaching and learning of science. Students will gain experience in data collection and analysis and will prepare an action research proposal based on their individual teaching situation. Offered Spring.

MSSE 506 Crime Scene Investigators: Forensic Science for Teachers: 2 Credits (1 Lec, 1 Lab)

() Offered spring of even years. "Crime Scene Investigators: Forensic Science for Teachers" is an exciting, hands-on course which is applicable to elementary school, middle school and high school teachers. Students will develop science process skills, demonstrate knowledge of the nature of science, in addition to implementing inquiry-based labs in their specific teaching context. Students will share cross-level instructional practices and creative pedagogical ideas. The principle goal of this course is to promote the study of forensics; an applied, cross disciplinary science and its implementation in the K-12 teaching environment. This fourteen week course is intended for teachers enrolled in the MSSE program. Offered Spring.
Repeatable up to 2 credits.

MSSE 507 Capstone Data Analysis: 2 Credits (1 Lec, 1 Lab)

() Offering TBD. This course is designed to provide graduate students in science education with a background in basic descriptive and inferential statistics. By the end of the course, students will be able to choose the most appropriate method to both describe their data and display that data in a clear and concise manner. Students will be able to perform hypothesis tests using a variety of parametric and non-parametric methods with an understanding of the assumptions and limitations of each method as applied to the analysis of Capstone data reported students' Capstone paper, the culminating project for MSSE students. Offered Summer.

MSSE 508 Statistics Bootcamp for MSSE Capstone Projects: 1 Credits (1 Lab)

(Sp) This one-day seminar and supplemental online component is designed as a crash-course in how to present a story using data that are commonly collected during Capstone Research projects for the MSSE program. Offered Summer.

MSSE 509 Implementing Action Research in Science Education: 3 Credits (2 Lec, 1 Other)

(F) This course is designed for the implementation of action research for practicing science teachers. Students will learn how to effectively conduct research based on the action research model. Prerequisites are MSSE 504 Formative Assessment in Science and MSSE 505 Foundations of Action Research in Science Teaching and Learning. Offered Fall.

MSSE 511 STEM Methods for Teachers: 2 Credits (1 Lec, 1 Other)

This course is designed to introduce the concepts of science, technology, engineering and mathematics (STEM) instructional design to equip teachers of science to meet and exceed emerging standards of teaching STEM. A balanced approach of content knowledge in the STEM areas and educational pedagogy will be the cornerstones of the course.

MSSE 518 Master Teaching Strategies for Science Teachers: 3 Credits (1 Lec, 1 Lab, 1 Other)

() Offered spring, odd years. The Master Teaching Strategies for Science Teachers course is designed for science teachers as a professional development tool to increase the effectiveness and awareness of effective teaching strategies. Teachers in this course will study and implement a variety of teaching strategies with students in their classrooms and reflect on the effectiveness of each implemented strategy. Offered Spring.

MSSE 536 Construction Curriculum in Science Education: 2 Credits (1 Lec, 1 Other)

() Offered summer, odd years. This course examines the philosophical, historical, and social influences that drive the construction of curriculum. Emphasis is placed on science curriculum past, present, and future. After completing this course, science teachers will be equipped with a greater understanding of the workings of science curriculum development. Offered Summer.

MSSE 537 The 3 D's of NGSS: 2 Credits (1 Lec, 1 Other)

() Offered even summers. The course is designed to survey the three dimensions of the Next Generation Science Standards (NGSS): science engineering practices, crosscutting concepts and disciplinary core ideas. Each dimension will be examined with emphasis on the interconnectness of the dimensions. The course will help teachers of science, regardless of level or content, teaching in formal or informal settings to better understand the underpinnings of NGSS and to develop strategies to implement NGSS dimensions in their teaching. Weekly assignments include online readings, discussion among colleagues and reflection and application of the content. Offered Summer.

MSSE 575 Capstone Paper and Symposium in Science Education: 1-3 Credits (1-3 Other)

PREREQUISITE: MSSE 501, MSSE 504, MSSE 505, MSSE 509. (Su)
Each Master of Science in Science Education (MSSE) student, with the cooperation of her or his graduate committee, identifies and completes a science education capstone project. The results of each student's capstone project are summarized in a written, professional paper completed by mid-term of the final summer session. In addition, during the final summer session of a student's graduate program each student presents their capstone project to their committee, their classmates, and other interested persons at the Symposium in Science Education. Offered Summer
Repeatable up to 3 credits.

MSSE 589 Graduate Consultation: 1-3 Credits (1-3 Other)

PREREQUISITE: Master's standing and approval of the Dean of Graduate Studies. (Su) This course may be used only by students who have completed all of their coursework (and thesis, if on a thesis plan) but who need additional faculty or staff time or help
Repeatable up to 3 credits.

MSSE 591 Special Topics: 1-4 Credits (1-4 Lec)

PREREQUISITE: Upper division courses and others as determined for each offering. Courses not required in any curriculum for which there is a particular one time need, or given on a trial basis to determine acceptability and demand before requesting a regular course number
Repeatable up to 12 credits.

MSSE 592 Independent Study: 1-3 Credits (1-3 Other)

PREREQUISITE: Bachelor degree, consent of instructor, and admission to MSSE program. () Offered on demand. Directed research and study on an individual topic
Repeatable up to 6 credits.