MSSE - Master of Science Education

MSSE 501. Inquiry Sci Eng Prac. 2 Credits. (2 Lec) ES,Su
PREREQUISITE: Approved education methods course. 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.

MSSE 502. Emerging Technology and the Science Classroom. 3 Credits. (1 Lec, 1 Ind, 1 Rct) 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.

MSSE 503. Integrating Literature into the Science Classroom. 3 Credits. (1 Lec, 2 Rec) S
PREREQUISITES: Upper division courses and others as determined for each offering. This course is designed for elementary, middle and high school teachers of science. The course provides effective strategies to integrate literature in the 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.

MSSE 504. Formative Assess in Sci Ed. 3 Credits. (2 Lec. 1 Rec) F
PREREQUISITES: A minimum of 2 years teaching experience. Formative assessment is an ongoing process that engages 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.

MSSE 505. Foundations of AR in Sci Ed. 3 Credits. (2 Lec. 1 Rec) S
PREREQUISITES: A minimum of 2 years teaching experience and acceptance in the MSSE Program. 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.

MSSE 506. Crime Scene Investigators: Forensic Science for Teachers. 2 Credits. (1 Lec. 1 Lab)
PREREQUISITES: Teachers with a minimum of three years teaching experience. “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.

MSSE 507. Capstone Data Analysis. 2 Credits. (2 Lec/Lab) S
PREREQUISITES: Bachelor degree in education, science education, or science field. 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.

MSSE 509. Implementing Action Research in Science Education. 3 Credits. (2 Lec. 1 Rec) F
PREREQUISITES: A minimum of 2 years teaching experience, enrollment in the MSSE Program and successful completion of MSSE 504 and MSSE 505. 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.

MSSE 518. Master Teaching Strategies for Science Teachers. 3 Credits. (1 Lec. 1 Ind, 1 Rec) S
PREREQUISITES: Graduate level standing with 2 years minimum teaching experience or consent of the instructor. 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.

MSSE 536. Construction Curriculum in Science Education. 3 Credits. (2 Lec. 1 Rec) Su
PREREQUISITES: A minimum of 2 years teaching experience. 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. Where did it start? How has it evolved? What is around the bend in the future? Current trends such as standards, inquiry, and high-stakes testing that influence curriculum will be considered in relationship to your own teaching experiences. After completing this course, science teachers will be equipped with a greater understanding of the workings of science curriculum development.

MSSE 537. The 3 D’s of NGSS. 2 Credits. (1 Lec. 1 Rec) S
PREREQUISITES: Teacher of science with a minimum of 2 years teaching experience. 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 interconnectedness 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.

MSSE 538. Master Consultation. 1-3 Credits. (1-3 Ind; 6 cr max) On Demand
PREREQUISITE: Master’s standing and approval of the Dean of Graduate Studies. 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. 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.

MSSE 589. Graduate Consultation. 1-3 Credits. (1-3 Ind; 3 cr max)
PREREQUISITE: Master’s standing and approval of the Dean of Graduate Studies. 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.

MSSE 591. Special Topics. 1-4 Credits. (1-4 Lec; 12 cr max)
On Demand Max 12 cr. 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.

MSSE 592. Independent Study. 1-3 Credits. (1-3 Ind; 6 cr max)
On Demand Max 6 cr. PREREQUISITE: Bachelor degree, consent of instructor, and admission to MSSE program. Directed research and study on an individual topic.