SECONDARY EDUCATION IN MATHEMATICS AND SCIENCE (SEMS)

SEMS 110 INTRODUCTION TO STEM TEACHING I: INQUIRY APPROACHES TO TEACHING (1)
A first exploration into teaching as a career, emphasizing inquiry-based science and constructivist mathematics. Field experience with upper elementary grades includes two classroom observations and three teaching experiences.

SEMS 120 INTRODUCTION TO STEM TEACHING II: INQUIRY-BASED LESSON DESIGN (1)
A second exploration into teaching as a career, focusing on the development of SE lesson plans aligned to district curricula; attributes of adolescent students; utilization of technology; questioning strategies; and formal and informal methods of assessment. Middle school field experience in either mathematics or science includes classroom observations and three teaching experiences. Credit will not be given for both SEMS 120 and SEMS 130. Prerequisite: SEMS 110.

SEMS 130 INTRODUCTION TO STEM TEACHING I & II COMBINED (2)
A first exploration into teaching as a career, emphasizing inquiry-based science and constructivist mathematics. The focus is on the development of SE lesson plans aligned to district curricula; attributes of adolescent students; utilization of technology; questioning strategies; and formal and informal methods of assessment. Middle school field experience in either mathematics or science includes two classroom observations and four teaching experiences. Credit will not be given for both SEMS 120 and SEMS 130. This course is available to juniors, seniors, and transfer students.

SEMS 230 KNOWING AND LEARNING (3)
For prospective mathematics and science teachers to construct the model of knowing and learning that they will take with them into their classrooms. Focuses on issues of what it means to know and learn science and mathematics: What are the standards for knowing? How are knowing and learning structured? How does what we know change and develop? Prerequisite: SEMS 120 or SEMS 130 (may be taken concurrently).

SEMS 240 CLASSROOMS INTERACTIONS (3)
Centered around a close examination of the interplay between teachers, students, and content, and how such interactions enable students to develop deep conceptual understanding, students design and implement instructional activities informed by their understanding of knowing and learning mathematics and science. Focus is given to building awareness and understanding of equity issues and their effects on learning and developing strategies for teaching students of diverse backgrounds equitably. Prerequisites: SEMS 120 or SEMS 130, SEMS 230 (may be taken concurrently).

SEMS 250 PERSPECTIVES IN SCIENCE AND MATHEMATICS (3)
Explores a selection of topics and episodes in the history of science and mathematics. Illustrates how knowledge has often emerged through torturous struggles against obstinate resistance and within cultural, religious, and social structures. Students are brought to understand that science and mathematics are not merely bodies of facts, theories, and techniques; they involve diverse processes by which they are continually generated and formulated. Prerequisite: MATH 115 or MATH 119 or MATH 211 (may be taken concurrently) or MATH 273 (may be taken concurrently). Core: Arts & Humanities.

SEMS 360 RESEARCH METHODS (3)
Students develop and practice skills that are fundamental to the scientific enterprise in a laboratory setting and use mathematics/statistics to model and explain both the natural and man-made worlds. Four student-produced written inquiries are evaluated as examples of scientific writing. Requires grade of C or better to fulfill Core or GenEd requirement. Prerequisites: ENGL 102 or ENGL 190, SEMS 230 and SEMS 250. Core: Advanced Writing Seminar.

SEMS 370 PROJECT-BASED INSTRUCTION (3)
Course has three essential components: a theory-driven perspective about how people learn and how project-based instruction may be among our most informed classroom learning environments; a technological component that will assist students in developing their own project-based unit; a field experience of observation and teaching of well-implemented project-based instruction in local schools. Prerequisites: SEMS 230 and SEMS 240.

SEMS 498 INTERNSHIP IN MATHEMATICS AND SCIENCE SECONDARY EDUCATION (3)
Clinical experience in a professional development school the term immediately prior to the full-time student teaching internship. Focus on classroom management, technology utilization, and reflective practices. Prerequisites: SEMS 230, SEMS 240, SEMS 250, SEMS 360 (may be taken concurrently), and SEMS 370 (may be taken concurrently). Graded S/U.