

SECONDARY EDUCATION IN MATHEMATICS AND SCIENCE (SEMS)

Courses

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. Prerequisites: freshman standing and instructor permission.

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. Students who have successfully completed SEMS 120 will not receive additional credit for SEMS 130.

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) or SCED 305 (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. Prerequisites: MATH 115 or higher, or qualifying score on Math Placement exam. Core: Arts & Humanities.

SEMS 260 DIVERSITY AND DIFFERENCE IN THE STEM CLASSROOM (3)

Examines what it means to be a diverse learner and helps prepare teachers to respond to diverse student needs in their classroom. Emphasis is placed on the roles teachers as decision-makers play in meeting the educational needs of learners of diverse identities. Specifically focuses on STEM education and the specialized pedagogy required in those disciplines. Prerequisite: SEMS 250 or SEMS 120 or SEMS 130. Core: Diversity & Difference.

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 240 and admission to Towson UTeach Program.

SEMS 430 SEMINAR IN APPRENTICE TEACHING (1)

Seminar for full-time mathematics and science student interns to discuss topics from the classroom experience and current issues. Graded S/U. Corequisite: MATH 426 or SCIE 393. Prerequisites: SEMS 498 and permission of Towson UTeach.

SEMS 470 SELECTED TOPICS IN STEM EDUCATION (3)

Special topics in STEM education. Content varies. May be repeated once for a total of 6 units provided a different topic is covered.

SEMS 495 INDEPENDENT STUDY IN SEMS (1-3)

An opportunity for especially qualified students to undertake research problems or study projects relevant to their interest and training under the direction of a staff member.

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. Prerequisite: by permission of Towson UTeach. Graded S/U. Internship/Practicum fee will be assessed.