

# Science Education (Secondary) (SCES)

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Course information contained within the Bulletin is accurate at the time of publication in July 2024 but is subject to change. For the most up-to-date course information, please refer to the Course Catalog.

## **SCES 2189. Classroom Interactions. 3 Credit Hours.**

This course continues the process of preparing students to teach mathematics and science in upper elementary and secondary settings. The specific objectives of this course are to: 1) demonstrate to students how learning theories (from the "Knowing and Learning" course) manifest themselves in instructional settings (usually classrooms), allow students to design and implement instructional activities from their own understanding of knowing and learning mathematics and science, and evaluate the outcomes of those activities based on evidence from student artifacts, and 2) provide students with frameworks for thinking about equity issues in the classroom and larger school setting and their effects on learning and provide students with strategies for teaching diverse students equitably. The culminating activities of the course are the opportunities for students to teach in a high school and to learn whether they enjoy and are good at it. While in "Knowing and Learning" students study the meaning behind understanding a particular content area from an individual perspective, in "Classroom Interactions" the perspective shifts to studying how classroom events might promote or discourage learning mathematics and science and student equity. A major component of the "Classroom Interactions" course is the opportunity for students to reflect on and evaluate their own work as teachers.

**Repeatability:** This course may be repeated for additional credit.

**Pre-requisites:** Minimum grade of C- in EDUC 2179 (may be taken concurrently) and (SCTC 1289 or SCTC 1389)

## **SCES 3146. The Teaching of Science in Secondary Schools. 3 Credit Hours.**

For students beginning their classes in science teaching at the secondary level. This course must be taken before student teaching. Role of science education in the secondary curriculum, and sources of material and content for teaching physical, biological, earth sciences and environmental sciences are covered.

**College Restrictions:** Must be enrolled in one of the following Colleges: Education & Human Development.

**Student Attribute Restrictions:** Must be enrolled in one of the following Student Attributes: Clearance for Education.

**Cohort Restrictions:** Must be enrolled in one of the following Cohorts: EDCNDCY.

**Co-requisites:** EDUC 4389.

**Repeatability:** This course may not be repeated for additional credits.

## **SCES 4146. Teaching Science in Secondary Schools II. 3 Credit Hours.**

This course serves as the second science education course. In this course, we will continue to use ideas generated in SCES 3146, such as meaningful understanding, how children's ideas progress as they become more sophisticated, and designing instruction around inquiry experiences, in order to take a deeper look at curriculum, instruction and learning at the secondary level. In addition, we will cover the following ideas: (1) units of instruction, as well as the relationships among units, (2) connections to other fields, specifically math and models as a way to understand more sophisticated science ideas, (3) relationships among big ideas in science (and across science courses), (4) the learning environment (i.e. level of task, management-motivation-instruction connections), and (5) accounting for language, culture and social backgrounds in science teaching/learning. Throughout the semester, we will examine and reflect on science content, field experiences, unit planning and curricula, video vignettes, connections to help us meet the objectives. NOTE: Background clearances required.

**College Restrictions:** Must be enrolled in one of the following Colleges: Education & Human Development.

**Student Attribute Restrictions:** Must be enrolled in one of the following Student Attributes: Clearance for Education.

**Cohort Restrictions:** Must be enrolled in one of the following Cohorts: EDCNDCY.

**Co-requisites:** EDUC 4389.

**Repeatability:** This course may not be repeated for additional credits.

**SCES 4189. Project-Based Instruction. 3 Credit Hours.**

"Project-Based Instruction" (PBI) is the capstone course in the sequence of required education courses and is required before TUTEACH students take Education 4688: "Student Teaching in Secondary Education." PBI is the course in which the major themes of the TUTEACH program - integrated content of mathematics and science learning, infusion of technology in representation, analysis, modeling, assessment and contextualization of the content, field-based experiences, and equity - converge into an exciting and intellectually challenging culminating experience. When students complete PBI, they are fully prepared for Student Teaching. Whereas in "Classroom Interactions," students gain experience designing a sequence of several lessons that they teach to a high school class, in PBI, students design full units of connected lessons - a skill that is required in Student Teaching. PBI also provides students with the experience of managing lessons and students outside a classroom, in a field setting. Despite its name, PBI emphasizes choosing from a variety of appropriate teaching styles, depending on the type of material and the learning objective, with project-based instruction being just one possible alternative. In addition, PBI requires students to incorporate various technologies into the units they plan.

**Student Attribute Restrictions:** Must be enrolled in one of the following Student Attributes: TUTEACH.

**Repeatability:** This course may be repeated for additional credit.

**Pre-requisites:** Minimum grade of C- in (SCES 2189 and '100' in PRAX) and minimum GPA of 3 in: courses numbered 0700 to 4999.