

## Course Descriptions

### SCIE 1201 Step 1: Inquiry Approaches to Teaching

Step 1 allows students to explore teaching as a career. Following an introduction to the theory and practice behind excellent inquiry-based science and mathematics instruction, students work in pairs to observe two and teach three lessons in elementary classrooms to obtain firsthand experience in planning and implementation. **Prerequisite:** None

### SCIE 1202 Step 2: Inquiry-Based Lesson Design

In Step 2, students continue developing the lesson planning skills learned in Step 1 as they become familiar with exemplary middle school science and mathematics curricula. After observing a lesson being taught in a local school district classroom, students work in pairs to plan and teach three inquiry-based lessons to middle school students. **Prerequisite:** SCIE 1201

**SCIE 1334 Step 1 & 2 Combo** *Restricted to juniors and seniors; may be taken in lieu of SCIE 1201 & 1202*

### SCIE 4331 Knowing & Learning

Psychological foundations of learning; problem solving in mathematics and science education utilizing technology; principles of expertise and novice understanding of subject matter; implications of high-stakes testing; and foundations of formative and summative assessment. **Prerequisite:** SCIE 1201 or SCIE 1334 (or concurrent)

### SCIE 4332 Classroom Interactions

Principles of delivering effective instruction in various formats (lecture, lab activity, collaborative settings); examination of gender, class, race, and culture in mathematics and science education; overview of policy related to mathematics and science education. Includes approximately 6 hours of field experience at the high school level. **Prerequisite:** SCIE 1202 or SCIE 1334; SCIE 4331 (or concurrent)

### PHIL 2314 Perspectives on Science & Mathematics

Topics and episodes in the history of science and mathematics from a philosophical point of view. Students are brought to understand that science has a fascinating history, is underpinned by deep philosophical presuppositions, and depends upon special social and cultural factors for its continued growth and revision. **Prerequisite:** None

### MATH 2330 Functions & Modeling *Taken only by 7-12 Mathematics students*

Students engage in explorations and lab activities designed to strengthen and expand their knowledge of the topics found in secondary mathematics. Students collect data and explore a variety of situations that can be modeled using linear, exponential, polynomial, and trigonometric functions. Activities are designed to take a deeper look at topics exposed to previously; illuminate the connections between secondary and college mathematics; illustrate good, as opposed to typically poor and sometimes counterproductive, uses of technology in teaching; illuminate the connections between various areas of mathematics; and engage in serious (i.e., non-routine) problem solving, problem-based learning, and applications of mathematics. While there is some discussion of how the content relates to secondary mathematics instruction, the course primarily emphasizes mathematics content knowledge and content connections, as well as applications of the mathematics topics covered. **Prerequisite:** SCIE 1201 or SCIE 1334 (or concurrent); MATH 2425

**XXXX 4343 Research Methods** *Cross-listed as: BIOL 4343, CHEM 4343, GEOL 4343, PHYS 4343*

Presents students with the tools scientists use to solve scientific problems, enabling them to develop new knowledge and insights. These tools include: design of experiments to answer scientific questions; use of statistics to interpret experimental results and deal with sampling errors; mathematical modeling of scientific phenomena; finding and reading articles in the current scientific literature; applying scientific arguments in matters of social importance; writing scientific papers; reviewing scientific papers; oral presentation of scientific work; use of probes and computers to gather and analyze data; ethical treatment of human subjects; laboratory safety. Primarily a laboratory course; topics are developed in connection with four independent inquiries students design and carry out. Written inquiries are evaluated as examples of scientific writing. **Prerequisite:** SCIE 1201 or SCIE 1334 (or concurrent); junior or senior standing

**SCIE 4333 Multiple Teaching Practices**

Multiple research-based teaching practices including foundations of project-based, case-based, and problem-based learning environments; principles of project-based curriculum development in mathematics and science education; classroom management and organization of inquiry-based, problem-based/project-based learning classrooms. Includes approximately 10 hours of field experience at the high school level. **Prerequisite:** SCIE 4332

**SCIE 4607/4107 Capstone Teaching Experience**

The Capstone Teaching Experience is a closely supervised half-time field experience in a cooperating high school that requires students to carry out the duties of a secondary teacher. Weekly on-campus seminar discussions include teaching experiences, contemporary critical issues in education, and preparation for the state certification exams. This experience takes place in the graduating semester. **Prerequisite:** SCIE 4333

**Field Experiences**

- SCIE 1201 requires 5 field hours in an elementary school.
- SCIE 1202 requires 4 field hours in a middle school.
- SCIE 4332 and SCIE 4333 require 6 and 10 field hours, respectively, in a high school.
- The scheduling of early field experience hours is somewhat flexible; each visit to the school is arranged between the student and his/her mentor teacher at the school, with direction from the course instructor.
- The Capstone Teaching Experience is a 14-week, almost full-time experience in which students take on the role of teacher at a high school.
- Students must pass a criminal background check prior to beginning a field placement.

**Program Completion Plan**

There is some flexibility; consult the UTeach advisor to create an individual plan. Note: Math students add MATH 2330.

Graduation	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6	Term 7	Term 8
<b>4 Years</b>	SCIE 1201	SCIE 1202	SCIE 4331	SCIE 4332	PHIL 2314	XXXX 4343	SCIE 4333	SCIE 4607 SCIE 4107
<b>3.5 Years</b>	SCIE 1201	SCIE 1202 SCIE 4331	SCIE 4332	PHIL 2314	XXXX 4343	SCIE 4333	SCIE 4607 SCIE 4107	
<b>3 Years</b>	SCIE 1201	SCIE 1202 SCIE 4331	SCIE 4332	PHIL 2314 XXXX 4343	SCIE 4333	SCIE 4607 SCIE 4107		
<b>2.5 Years</b>	SCIE 1201	SCIE 1202 SCIE 4331	SCIE 4332 PHIL 2314	SCIE 4333 XXXX 4343	SCIE 4607 SCIE 4107			
<b>2 Years</b>	SCIE 1334 SCIE 4331	SCIE 4332 PHIL 2314	SCIE 4333 XXXX 4343	SCIE 4607 SCIE 4107				
<b>1.5 Years</b>	SCIE 1334 SCIE 4331 PHIL 2314	SCIE 4332 SCIE 4333 XXXX 4343	SCIE 4607 SCIE 4107					