

# Science and Mathematics Education

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## Overview

The Graduate Group in Science and Mathematics Education (SESAME) is an interdisciplinary academic unit dedicated to advancing the understanding and practice of learning and teaching in science, engineering, and mathematics. It acts in most respects like a regular department, carrying out research, teaching courses, and offering a graduate program leading to a PhD degree in science or mathematics education. The faculty of the group consists of professors from several of the Berkeley science and engineering departments and the School of Education, and instructors associated with other units on campus, such as the Lawrence Hall of Science. The group operates under the auspices of the Graduate Division.

SESAME is closely related to the LSHD (Learning Sciences and Human Development) program and shares many courses with LSHD. A major difference in the programs is that SESAME students are expected to obtain at least master's level competency in their mathematical or scientific disciplines. It produces scholars who can communicate well with scientists and engineers, as well as with educational researchers and practitioners. The program includes studies that connect human development, cognitive science, and educational technology with the learning of science, mathematics, and engineering.

SESAME PhDs have frequently taken positions in college science, mathematics, and engineering departments, teaching courses in the discipline but also serving as the "education person" in the department and doing research on the teaching and learning of the subject matter. Through the years SESAME students have also focused on learning in informal settings and have gone on to careers in institutions such as museums and science centers.

## Undergraduate Program

There is no undergraduate program in Science and Mathematics Education.

## Graduate Program

Science and Mathematics Education (<https://guide.berkeley.edu/archive/2024-25/graduate/degree-programs/science-mathematics-education/>): PhD

## Science and Mathematics Education

### SCMATHE 210 Practicum in Science and Math Education Research and Development 1 - 4 Units

Terms offered: Fall 2025, Spring 2025, Fall 2024

Practical experience on an educational research or development project on campus or elsewhere for 8-12 hours per week. Class meetings augment research experience with discussions of readings and interaction with guest speakers.

#### Rules & Requirements

**Prerequisites:** Consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

#### Hours & Format

**Fall and/or spring:** 15 weeks - 0 hours of fieldwork per week

#### Additional Details

**Subject/Course Level:** Science and Mathematics Education/Graduate

**Grading:** Letter grade.

### SCMATHE 220C Instructional Design in Science and Mathematics Education 3 Units

Terms offered: Spring 2025, Spring 2023, Spring 2021

Survey of literature on design of instruction in science and mathematics, including development of computer-based instruction. Includes consideration of evaluation methods and development of instruction modules for topics in science and mathematics.

#### Rules & Requirements

**Prerequisites:** 220B or consent of the instructor

#### Hours & Format

**Fall and/or spring:** 15 weeks - 3 hours of lecture per week

#### Additional Details

**Subject/Course Level:** Science and Mathematics Education/Graduate

**Grading:** Letter grade.

## SCMATHE 292 Research Seminar and Colloquium 1 Unit

Terms offered: Fall 2025, Spring 2025, Fall 2024

Discussion of current education research carried on by students, faculty, and guest speakers. A written analysis of several presentations required.

### Rules & Requirements

**Prerequisites:** Consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 2 hours of colloquium per week

### Additional Details

**Subject/Course Level:** Science and Mathematics Education/Graduate

**Grading:** Offered for satisfactory/unsatisfactory grade only.

## SCMATHE 294 Formulation of Educational Research 1 - 3 Units

Terms offered: Fall 2025, Fall 2024, Fall 2023

Development of thesis proposal under supervision of faculty member.

### Rules & Requirements

**Prerequisites:** Consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 0 hours of independent study per week

### Additional Details

**Subject/Course Level:** Science and Mathematics Education/Graduate

**Grading:** Letter grade.

## SCMATHE 295 Research 1 - 12 Units

Terms offered: Fall 2025, Spring 2025, Fall 2024

Independent research activities under supervision of a faculty member.

### Rules & Requirements

**Prerequisites:** Consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 0 hours of independent study per week

### Additional Details

**Subject/Course Level:** Science and Mathematics Education/Graduate

**Grading:** Letter grade.

## SCMATHE 299 Individual Reading and Study 1 - 5 Units

Terms offered: Fall 2025, Spring 2025, Fall 2024

Individual reading and study under the supervision of a faculty member.

### Rules & Requirements

**Prerequisites:** Consent of instructor

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 0 hours of independent study per week

### Additional Details

**Subject/Course Level:** Science and Mathematics Education/Graduate

**Grading:** Letter grade.

## SCMATHE 602 Individual Study for Qualifying Examination 1 - 8 Units

Terms offered: Fall 2025, Spring 2025, Fall 2024

Individual study, under the supervision of a faculty member, designed to prepare the student for Ph.D qualifying examination.

### Rules & Requirements

**Prerequisites:** Consent of instructor

**Credit Restrictions:** Course does not satisfy unit or residence requirements.

**Repeat rules:** Course may be repeated for credit without restriction.

### Hours & Format

**Fall and/or spring:** 15 weeks - 0 hours of independent study per week

### Additional Details

**Subject/Course Level:** Science and Mathematics Education/Graduate examination preparation

**Grading:** Offered for satisfactory/unsatisfactory grade only.