

SCIENCE & MATH EDUCATION (SMED)

SMED 1011 Inquiry Approaches to Teaching - Step 1

Prerequisites: Interest in exploring teaching as a career.

Description: Master teachers introduce students to examples of high-quality inquiry-based lessons and model the educational concepts to which they are being introduced. In Step 1, students prepare and participate in the teaching of three (3) lessons in elementary classrooms.

Credit hours: 1

Contact hours: Lab: 2

Levels: Undergraduate

Schedule types: Lab

Department/School: Teaching, Learning, Ed Science

SMED 2011 Inquiry-Based Lesson Design-Step 2

Prerequisites: SMED 1011 and an interest in exploring teaching as a career.

Description: Master teachers introduce students to examples of high-quality inquiry-based lessons and model the educational concepts to which they are being introduced. In Step 2, students prepare and participate in the teaching of three (3) lessons in middle school classrooms.

Credit hours: 1

Contact hours: Lab: 2

Levels: Undergraduate

Schedule types: Lab

Department/School: Teaching, Learning, Ed Science

SMED 3013 Knowing and Learning in Mathematics and Science

Prerequisites: SMED 1011 and SMED 2011.

Description: Expands the prospective teacher's understanding of current theories of learning and conceptual development. Students examine their own assumptions about learning and critically examine the needs of a diverse student population in the classroom.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Undergraduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 3153 Teaching Mathematics at the Primary Level

Prerequisites: Grade of "C" or better in MATH 3403 or MATH 3603; six hours from MATH 1483, MATH 1493, MATH 1513, MATH 1613, MATH 2103, MATH 2144 or STAT 2013; consent of instructor.

Description: Developmental levels in selection and organization of content and procedures for primary mathematics education.

Credit hours: 3

Contact hours: Lecture: 2 Lab: 2

Levels: Undergraduate

Schedule types: Lab, Lecture, Combined lecture and lab

Department/School: Teaching, Learning, Ed Science

SMED 4003 Teaching Fundamental Concepts of Mathematics

Prerequisites: Full admission to Professional Education.

Description: Teaching of the basic skill areas. Study and comparison of contemporary basic mathematics textbooks. Recommended to be taken concurrently with public school practicum experiences. Course previously offered as CIED 4003.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate, Undergraduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 4013 Classroom Interactions

Prerequisites: SMED 1011, SMED 2011, SMED 3013 and full admission to Professional Education.

Description: A close examination of the interplay between teachers, students, and content, and how such interactions enable students to develop deep conceptual understanding. Students will learn how content and pedagogy combine to create effective teaching.

Credit hours: 3

Contact hours: Lecture: 2 Lab: 2

Levels: Undergraduate

Schedule types: Lab, Lecture, Combined lecture and lab

Department/School: Teaching, Learning, Ed Science

SMED 4023 Problem-Based Learning in Mathematics and Science

Prerequisites: SMED 1011, SMED 2011, SMED 3013, SMED 4013, CIED 4613 or CIED 4003, and full admission to Professional Education.

Description: Explores authentic, important, and meaningful questions of real concern to students. Students will work in teams to formulate questions, make predictions, design investigations, collect and analyze data, make products and share ideas.

Credit hours: 3

Contact hours: Lecture: 2 Lab: 2

Levels: Undergraduate

Schedule types: Lab, Lecture, Combined lecture and lab

Department/School: Teaching, Learning, Ed Science

SMED 4053 Teaching Geometry in the Secondary School

Prerequisites: Full admission to Professional Education.

Description: Overview of the present secondary geometry curricula and future trends. Axiomatic development of Euclidean geometry, proofs and transformational geometry from the perspective of the secondary mathematics teachers. Study and comparison of contemporary basic mathematics textbooks. Recommended to be taken after or concurrently with MATH 4403. Course previously offered as CIED 4053.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate, Undergraduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 4153 Teaching Mathematics at the Intermediate Level

Prerequisites: SMED 3153 or SMED 5013 (for Graduate Students) and MATH 3403 and MATH 3603, full admission to Professional Education..

Description: Selection and organization of content, procedures for instruction, and evaluation of outcomes in teaching the mathematics of the intermediate grades. Some attention to instruction in upper grades of the elementary school. Course previously offered as CIED 4153.

Credit hours: 3

Contact hours: Lecture: 2 Lab: 2

Levels: Graduate, Undergraduate

Schedule types: Lab, Lecture, Combined lecture and lab

Department/School: Teaching, Learning, Ed Science

SMED 4353 Science in the Elementary School Curriculum

Prerequisites: Completion of 12 hours with a grade of "C" or better in required science courses and be fully admitted to Professional Education.

Description: The purposes, selection and organization of content, teaching and learning procedures and evaluation of outcomes in elementary school science. Course previously offered as CIED 4353.

Credit hours: 3

Contact hours: Lecture: 2 Lab: 2

Levels: Undergraduate

Schedule types: Lab, Lecture, Combined lecture and lab

Department/School: Teaching, Learning, Ed Science

SMED 4560 Environmental Education

Description: Development of (teacher/leader) competencies in the content, methods, philosophy, and historical perspective of contemporary environmental education curricula using both indoor and outdoor settings as a multidisciplinary learning laboratory. Same course as CIED 5730.

Course previously offered as CIED 4560. Offered for variable credit, 1-4 credit hours, maximum of 4 credit hours.

Credit hours: 1-4

Contact hours: Lecture: 1

Levels: Graduate, Undergraduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 4611 Authentic Research in the Science Classroom

Prerequisites: SMED 1101; SMED 2011; SMED 3013; SMED 4013; and concurrent enrollment in SMED 4613.

Description: This course is designed to strengthen pre-service science teachers' understanding of how scientific knowledge is generated by engaging in an authentic research experience under the mentorship of a STEM mentor. Students will also learn how to write a scientific manuscript.

Credit hours: 1

Contact hours: Lab: 2

Levels: Undergraduate

Schedule types: Lab

Department/School: Teaching, Learning, Ed Science

SMED 4613 Teaching the Nature of Science Through an Inquiry Approach

Prerequisites: Full admission to professional education.

Description: This course is designed to assist pre-service science teachers in developing skills to teach science through an inquiry approach. Guided readings, discussions, group activities, and classroom field experiences, will focus on strengthening views on the nature of science. Course previously offered as CIED 4613.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate, Undergraduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 4713 Teaching and Learning Science in the Secondary School

Prerequisites: CIED 4613, and full admission to Professional Education.

Description: Assists students in developing safe classroom practices, science curriculum, and educational assessments supported by teaching and learning theories. Weekly classroom field experiences are required. Must be taken the semester prior to student teaching/internship.

Credit hours: 3

Contact hours: Lecture: 2 Lab: 2

Levels: Graduate, Undergraduate

Schedule types: Lab, Lecture, Combined lecture and lab

Department/School: Teaching, Learning, Ed Science

SMED 4723 Senior Seminar in Secondary Mathematics and Science Education

Prerequisites: SMED 1011, SMED 2011, SMED 3013, SMED 4013, SMED 4023, CIED 4613 or CIED 4003, and CIED 4713 or CIED 4053, and full admission to Professional Education.

Description: Explores classroom management and discipline approaches as well as teacher research, parental involvement, school climate and community relations.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate, Undergraduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 4813 Yellowstone Science for Educators (N)

Description: Explore the science of the Greater Yellowstone Area (GYA). This course focuses on the systematic study of natural processes and mechanisms associated with the GYA. Emphasis is placed on the biological and physical (chemistry, earth, and physics) science concepts that have formed the parks that exist today. Consequences of human intervention are addressed. Applications of science content to K-12 classroom curricula are addressed. Required field trip to the GYA.

Credit hours: 3

Contact hours: Lecture: 2 Lab: 2

Levels: Undergraduate

Schedule types: Lab, Lecture, Combined lecture and lab

Department/School: Teaching, Learning, Ed Science

General Education and other Course Attributes: Natural Sciences

SMED 5013 Mathematics Education: Theory and Practice(Grade 1-4)

Prerequisites: MATH 3403 and MATH 3603, Admission to MAT, Full admission to Professional Education.

Description: Curriculum, materials, methods, and procedures related to the theory and practices of teaching mathematics in grades 1-4. Meets with SMED 3153. No degree credit for those with credit in SMED 3153.

Credit hours: 3

Contact hours: Lecture: 2 Lab: 2

Levels: Graduate

Schedule types: Lab, Lecture, Combined lecture and lab

Department/School: Teaching, Learning, Ed Science

SMED 5050 Seminar in Integrated Mathematics and Science Applications

Description: Seminar topics may differ depending upon the nature of current interests and topics in mathematics and science education. Course previously offered as CIED 5050. Offered for variable credit, 1-6 credit hours, maximum of 6 credit hours.

Credit hours: 1-6

Contact hours: Lecture: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 5083 Teaching Science in the Elementary School (Grades 1-8)

Description: Curriculum, materials, methods, and procedures related to the theory and practice of science teaching in grades 1-8. Course previously offered as CIED 5083.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 5113 Knowing and Learning in Mathematics and Science

Prerequisites: Admission to MAT program or consent of instructor.

Description: Expands the prospective teacher's understanding of current theories of learning and conceptual development. Students examine their own assumptions about learning and what it means to teach. They critically examine the needs of a diverse student population in the classroom. Meets with SMED 3013. No degree credit for those with credit in SMED 3013.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 5123 Classroom Interactions in Mathematics and Science

Prerequisites: SMED 5113 and Admission to MAT program or consent of instructor.

Description: A close examination of the interplay between teachers, students, and content, and how such interactions enable students to develop deep conceptual understanding. Students will learn how content and pedagogy combine to make effective teaching. Includes a school-based field experience. Meets with SMED 4013. No degree credit for those with credit in SMED 4013.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 5133 Problem-Based Learning in Mathematics and Science

Prerequisites: SMED 5113 and Admission to MAT program or consent of instructor.

Description: Explores authentic, important, and meaningful questions of real concern to students. Students will work in teams to formulate questions, make predictions, design investigations, collect and analyze data, make products and share ideas. Includes a school-based field experience. Meets with SMED 4023. No degree credit for those with credit in SMED 4023.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 5193 Inquiry and Problem-Based Learning in Science Education

Prerequisites: Completion of Bachelor's degree.

Description: Different aspects of teaching science through inquiry methods. Using current research as a guide, students will define scientific inquiry teaching and learning, explore assessing inquiry, and evaluate the roles of students, teachers, and discourse in the science classroom.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 5223 Teaching Science in the Schools

Description: Materials, methods and classroom procedures related to science in grades K-12. Course previously offered as CIED 5223.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 5243 Environmental Education in the Curriculum

Description: Integration of environmental concepts in the total school curriculum. Review of P-12 environmental education curricula and methods of teaching environmental education in formal and nonformal settings. Course previously offered as CIED 5243.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 5253 Teaching Rational Number Concepts, Proportional Reasoning, and Classroom Interactions

Prerequisites: Completion of a Bachelor's degree.

Description: Focus on teaching rational number concepts and developing proportional reasoning skills; attention given to learning methods which facilitate appropriate classroom interactions.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 5263 Assessment and Evaluation in School Mathematics

Description: Focus on classroom assessment to help teachers identify what students know about critical mathematics concepts, skills, procedures, and facts. Emphasis would be on using that information to inform their instructional decisions and enhance student learning. Course previously offered as CIED 5263.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 5270 Practicum in School Mathematics

Description: Diagnostic and therapeutic procedures in mathematics with students of all ages. Laboratory classes provide for clinical experiences in evaluation and instruction with children experiencing difficulty in mathematics. Course previously offered as CIED 5270. Offered for variable credit, 1-3 credit hours, maximum of 6 credit hours.

Credit hours: 1-3

Contact hours: Other: 1

Levels: Graduate

Schedule types: Independent Study

Department/School: Teaching, Learning, Ed Science

SMED 5273 Number Concepts and Assessment at the Elementary Level (PK-6)

Description: Analysis and construction of effective mathematical tasks in teaching number systems and operations at the PK-6 level; attention is also given to the expansion of content knowledge and issues related to assessment. Course previously offered as CIED 5273.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 5280 Workshop in Science Education

Description: Develops and/or implements elementary and secondary science programs. Course previously offered as CIED 5280. Offered for variable credit, 1-4 credit hours, maximum of 4 credit hours.

Credit hours: 1-4

Contact hours: Other: 1

Levels: Graduate

Schedule types: Independent Study

Department/School: Teaching, Learning, Ed Science

SMED 5283 Problem-Centered Learning in Mathematics

Description: Focus on the different aspects of a problem-centered learning environment. Using current research as a guide, students will examine tasks, collaborative work, and the roles of students, teachers and discourse. Course previously offered as CIED 5283.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 5293 Teaching and Learning Mathematics in Technology

Description: The focus of this course is on research and methods of teaching and learning with technology in the mathematics classroom. Topics will include philosophical, social, developmental and theoretical issues associated with the development and use of technology and school reform. Activities and applications will be explored as they relate to the potential for providing a technology-rich learning environment conducive to student construction of mathematical knowledge. Course previously offered as CIED 5293.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 5613 Effective Teaching of Mathematics in the Secondary School

Prerequisites: Consent of instructor.

Description: Directed advanced practicum in secondary school mathematical education. Includes study of current research findings in mathematical education, teaching strategies, materials and evaluation procedures in the secondary school. For experienced classroom teachers, superintendents, principals and supervisors. Course previously offered as CIED 5613.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 5750 Seminar in Mathematics Education

Prerequisites: Consent of instructor.

Description: Problems, issues and trends in mathematics education. Course previously offered as CIED 5750. Offered for variable credit, 1-6 credit hours, maximum of 6 credit hours.

Credit hours: 1-6

Contact hours: Lecture: 1

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 5913 Teaching Geometry and Spatial Visualization

Prerequisites: Completion of a Bachelor's degree.

Description: Focus on the development of geometric concepts and spatial visualization. Attention given to the understanding of learning trajectories and their role in student learning. Course previously offered as CIED 5913.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 5923 Teaching Algebra and Mathematical Tasks

Prerequisites: Completion of a Bachelor's degree.

Description: Focus on algebra concepts of functional thinking and generalized arithmetic. Attention will be given to the analysis and construction of effective mathematical tasks in the teaching of algebra. Course previously offered as CIED 5923.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 5933 Teaching Data and Probability in Schools

Prerequisites: Completion of a Bachelor's degree.

Description: Focus on statistical literacy and the teaching of PK-12 data and probability concepts; emphasis on the use of instructional technology to enhance student learning.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 5943 Mathematics Leadership and Coaching

Prerequisites: Completion of a Bachelor's degree and nine hours from SMED 5253, SMED 5273, SMED 5913, SMED 5923, and SMED 5933.

Description: Develops skills and knowledge for school mathematics program design and leadership, and for coaching other teaching professionals in mathematics teaching. Course previously offered as CIED 5943.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 6013 Assessment in Science Education

Prerequisites: Completion of a bachelor's degree. Guided readings, discussions, and group activities focus on strengthening students' understanding of state and national assessments in science education.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 6123 Teaching the Nature of Science in Secondary Science**Education**

Prerequisites: Successful completion of a bachelor's degree.

Description: Guided readings, discussions, and group activities focus on strengthening views on the nature of science. Course previously offered as CIED 6123.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 6223 Instruction and Learning in Science and Mathematics**Education**

Prerequisites: Acceptance into a doctoral program.

Description: Focus on learning and teaching in science and mathematics education contexts. Students will analyze and synthesize research in science and mathematics education that are related to the learning sciences. Course previously offered as CIED 6223.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 6233 Affective Issues in Teaching Mathematics and Sciences

Prerequisites: Bachelor's Degree

Description: Explores current affective issues that influence the teaching and learning of mathematics and science. Students will explore topics such as beliefs, attitudes, emotions, motivation, efficacy, identity, and anxiety.

Credit hours: 3

Contact hours: Lecture: 3

Levels: Graduate

Schedule types: Lecture

Department/School: Teaching, Learning, Ed Science

SMED 6750 Research in Mathematics and Science Education

Description: The examination of current research in mathematics and science learning and teaching research designs, employed, and the generation of new hypotheses. Course previously offered as CIED 6750. Offered for variable credit, 1-6 credit hours, maximum of 6 credit hours.

Credit hours: 1-6

Contact hours: Other: 1

Levels: Graduate

Schedule types: Independent Study

Department/School: Teaching, Learning, Ed Science