

**San José State University**  
**College of Science/ Science Education Program**  
**SCED 297, Sci Ed Research, Section 1, Fall, 2022**

### **Course and Contact**

Instructor(s): Resa Kelly

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Office Hours: (Thursdays 4-5PM (through zoom or in person and available by appointment)

Class Days/Time: (Thursday 5 to 6PM)

Classroom: Zoom (link to be provided through Google calendar) or DH 246

### **Course Description**

Research in science education under the supervision of a faculty member associated with the science education program.

### **Course Format**

**This course provides guidance with students' research studies. It will consist of a check-in to learn how students are progressing on their projects. Students will discuss: their literature research, research questions, methodology, data analysis and results.**

### **Science Education Program Information**

The MS in Science Education is a flexible program designed for secondary science teachers, and for science educators and specialists working in informal or outdoor education. The curriculum is designed to augment and broaden an educator's background in science education theory and practice, as well as to enhance scholarly teaching. All Science Education Master's students create and produce a culminating project which allows them to exhibit the knowledge and skills they learn from participating in this program.

All students in the Science Education MS program complete a multi-semester project as a part of their master's degree. Students often have lots of questions about what project and culminating experience will look like. Here are some general guidelines for our projects:

**The essential components of project and culminating experience are:**

- The project is grounded in educational literature
- The student engages in reflection and analysis
- The student writes a paper (to promote reflection and demonstrate expertise in research or research to practice)

There are **three typical types of projects** that work well with these components:

1. Empirical study grounded in literature, including reflection/analysis as appropriate, for example:

- Treatment and analysis of treatment
- Qualitative examination of learning environment

2. Grounded curricular/research design project including the following elements:

- Discuss design principles strongly grounded in literature
- Produces novel curricular artifact
- Includes reflection (metacognitive piece)

3. Conceptual paper that draws deeply on existing literature to create new knowledge through development of theory (pushing theory forward)

- Requires analysis of literature, historical documents, policy and/or available data
- Result is recommendation or theory generation

### **Program Learning Outcomes**

Program Learning Goal 1 – To enhance student’s depth and breadth of understanding of selected topics in science education.

PLO 1.1 – Students will be able to synthesize primary literature from science education research and apply how it fits to their project.

PLO 1.2 – Students will demonstrate knowledge of at least two areas (e.g., inquiry-based instruction, learning theory, assessment) that are related to, or supportive of research for their project.

Program Learning Goal 2 - To enhance communication skills, both written and oral, in science education discourse.

PLO 2.1 - Students will present science and science education content in the form of graduate seminars or in the oral defense of their papers (also known as the culminating experience).

PLO 2.2 - Students will organize and write the results of their project in a manner consistent with standards in professional science education publications.

**Course Goals – Make progress on Science Education Project at all stages of the project.**

**Course Learning Outcomes (CLO) (Required - Delete the word “Required” in final draft)**

Students will be able to:

- progress on specific aspects of their personal projects.
- justify changes they have made to their projects.
- Reflect on the attributes, limitations and implications of their project design and the project designs of others.

Upon successful completion of this course, students will be able to:

Discuss the progress they made on their projects, including sections that have been completed and sections that need further development to complete.

### **Texts/Readings (Required - Delete the word “Required” in final draft)**

Nuts and Bolts of Chemical Education Research (2008) Editors: Diane M. Bunce and Renée S. Cole, ISBN13: 9780841269583

Qualitative Research: A Guide to Design and Implementation, Sharan B. Merriam (2009). Jossey-Bass, 3<sup>rd</sup> Ed.- ISBN-10: 0470283548; ISBN-13: 978-0470283547

### **Library Liaison**

Mantra Roy, [mantra.roy@sjsu.edu](mailto:mantra.roy@sjsu.edu), all aspects of education

Anne Marie Engelsen, [Annemarie.engelsen@sjsu.edu](mailto:Annemarie.engelsen@sjsu.edu), all aspects of science

**The course requires that students make personalized progress to their science education project.**

#### [University Policy S16-9](#)

“Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week) for instruction, preparation/studying, or course related activities, including but not limited to internships, labs, and clinical practical. Other course structures will have equivalent workload expectations as described in the syllabus.”

### **Final Examination or Evaluation**

Each student will give a presentation of progress they have made on their project.

“Faculty members are required to have a culminating activity for their courses, which can include a final examination, a final research paper or project, a final creative work or performance, a final portfolio of work, or other appropriate assignment.”

### **Grading Information**

This course is grades as credit or no-credit. Credit is earned by showing a good faith effort toward making ongoing progress on science education projects.

- [University Syllabus Policy S16-9](#)
- [University Attendance and Participation Policy F15-12](#)
- [University Grading System Policy F18-5](#)

Determination of Grades – the student will provide evidence of progress made toward their science education project. Such as enhancing their literature review, completing IRB, designing interview questions or a survey, analyzing results of data collection.

### **University Policies**

Per [University Policy S16-9](#), relevant university policy concerning all courses, such as student responsibilities, academic integrity, accommodations, dropping and adding, consent for recording of class, etc. and available student services (e.g. learning assistance, counseling, and other resources) are listed on [Syllabus Information web page](https://www.sjsu.edu/curriculum/courses/syllabus-info.php) (<https://www.sjsu.edu/curriculum/courses/syllabus-info.php>). Make sure to visit this page to review and be aware of these university policies and resources.

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### Course Schedule

**Each weekly meeting will consist of the following: Check in with each student (provide updates on ongoing project work), navigate all aspects of their projects, discuss goals – short term and long term.**

Supervision of the project is done on a case-by-case basis.