

## **SCI 5004 – Special Projects for Natural Science Teachers**

### **Purpose**

Students propose, design and conduct a science education research project in their classrooms or, a theoretical science research project both of which will be in consultation with and under the supervision of a faculty advisor. Projects may include theoretical, pedagogical or laboratory work. A written proposal must be approved by the student's M.S. in Natural Sciences faculty advisor and the M.S. in Natural Sciences program coordinator prior to conducting the project. Results (qualitative or quantitative data) must be submitted prior to the summer term in which students present their seminar.

### **Prerequisite**

Enrollment in M.S. in Natural Sciences degree program

### **Course Objectives**

Students will demonstrate the ability to:

1. Understand the elements of a research project of secondary science education.
2. Identify relevant and appropriate literature for science education.
3. Learn to integrate relevant literature into research proposals.
4. Construct and implement research which is relevant and appropriate to secondary science classrooms.
5. Evaluate, analyze and summarize research results.

### **Credit and Meeting Times**

2 semester hours credit. Course is offered Fall and Spring semesters.

### **Evaluation**

Final grades will be based on an evaluation of the written proposal and results/data submitted prior to presentation during SCI 5005 Seminar for Natural Science Teachers.

### **Procedure for Conducting your Project**

Scheduling for this course is determined by the student's anticipated graduation date and/or their teaching schedule. Students discuss their proposed project with their faculty advisor the summer prior to the academic year during which they will schedule and conduct their special project and submit a written proposal to their advisor and the program coordinator for review and evaluation. Course content will depend on the nature of the individual project. All projects will share a common framework illustrated by the following outline:

Phase I: Consultation with faculty advisor on selection and conduction of a special project.

Phase II: Conduct literature search to ensure uniqueness of project.

Phase III: Write project proposal to include hypothesis to be tested, outline of methods and materials, assessment rubric for determining success of project, and timeline for completion of project. Secure funding to offset cost for materials, equipment required.

Phase IV: Implementation of project to include construction or acquisition of necessary equipment and/or materials followed by subsequent accumulation of pertinent data for analysis. Execution of the mechanics of each project should be monitored through regular consultation with a faculty advisor.

Phase V: Results are collected, analyzed, and presented as a seminar in SCI 5005, *Seminar for Natural Science Teachers*, the anticipated summer of graduation.

### **Criteria for the Written Proposal**

- 1) The written proposal paper will include a purpose or need for a project of this type to be conducted. It may include references to past works of similar type and nature to substantiate the value of performing such a project.
- 2) A review and critique of existing literature pertinent to your project will be included and integrated into the proposal, the rationale being to immerse the principal investigator in recent literature and opinions relative to the topic of your investigation. The critique may include how past work/studies relate to your project, how your project is similar or different from past work/studies and how your project will add to the knowledge base of science and/or science education.
- 3) A minimum of 8 references must be included in the review.
- 4) The proposal must contain a detailed methods section outlining how you will conduct the research project. This section must include methods/means by which you will evaluate the results of your project whether it is by statistical analysis, scoring device such as an original rubric, or by other evaluation instruments. The scoring device should be included as an appendix in the proposal.
- 5) Text of the written proposal shall be 12 point font, double spaced with a maximum of 1 inch margins.
- 6) APA manuscript style will be used for the paper and the literature cited section.
- 7) Due dates:

#### Written proposal

The written proposal can be submitted anytime prior to your registration for SCI 5004. It must be submitted to your advisor and to the program coordinator by midterm of the semester you register for SCI 5004.

#### Data

Data (results) of your project should be submitted by the end of the term you register for SCI 5004. *Special arrangement may be made with your graduate advisor in the event you are conducting a research project on campus.* The data may be quantitative or qualitative depending upon the nature of your project. No analysis of the data is required at this time.