

# Bemidji State University

## CHEM 4895: Research II

### A. COURSE DESCRIPTION

Credits: 2

Lecture Hours/Week: \*.\*

Lab Hours/Week: \*.\*

OJT Hours/Week: \*.\*

Prerequisites: None

Corequisites: None

MnTC Goals: None

This second course in a two course research sequence in chemistry will continue to develop essential skills needed to be a chemist. Student researchers will formulate questions, utilize concepts and techniques learned in the classroom, and analyze arguments. Presentations and papers will communicate findings. Prerequisite(s): CHEM 4894, Junior status and consent of instructor.

**B. COURSE EFFECTIVE DATES:** 08/27/2018 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Use of scientific practices: Ask questions, propose hypotheses, design studies, select methods, analyze data, develop and critique arguments, and communicate findings
2. Discovery: Obtain new knowledge and insights and perform studies with unknown results
3. Relevant and important work: Contribute to current science knowledge, impact extends beyond class, and present and/or publish work
4. Collaboration: Work in a team, contribute special skills, interact with classmates and faculty, and communicate
5. Iteration: Repeat and revise previous experiments

### D. LEARNING OUTCOMES (General)

1. develop laboratory skills which may include solution preparation, pipetting, organic synthesis, and spectroscopic analysis.
2. practice standard operating procedures, including lab safety, and safely use, handle, and store chemicals and hazardous waste.
3. record experimental methods and results in a laboratory notebooks.
4. interpret data to characterize synthetic products, evaluate purity, and evaluate the response to analytes.
5. evaluate primary literature articles that are relevant to the research project and use them to guide project and place results in the context of the field.
6. summarize and explain experimental results in written and oral reports.
7. write a research progress report that models a scholarly paper and includes relevant background information, materials and methods, results and discussion, and supporting references.

### E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

### F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

**G. SPECIAL INFORMATION**

None noted