Prepared by: Andrew Allen   December 20, 2017
Status: Special Topics
Effective Term: Summer 2018

A. Identification:
1. Course Subject: Biology (BIO)
2. Course Number: 298
3. Course Title: STEM Science Teacher Outdoor Education Class Development
4. Credit Hours: 3
5. Course Description: Immersive program utilizing classroom and field research in developing a comprehensive STEM program for the classroom or school district. Prerequisite: Bachelor's degree in a STEM related discipline or Consent of Instructor. Three lecture.

B. Course Goals: To use a STEM based approach to analyze, evaluate, and assess scientific theories, processes, and relationships between Biology, Chemistry, Geology, Astronomy, Anatomy, and Physiology and to develop methods for integrating these ideas into a K-12 classroom setting.

C. Course Outcomes:
Upon completion of this course, students will:
1. Have an understanding of how many common scientific processes are related across disciplines
2. Be able to explain inter related scientific processes for K-12 classroom development
3. Perform basic biology, chemistry, and dissections experiments
4. Understand the process for applying for permits and permissions to enter National Parks
5. Be familiar with Lab Quest, hand held GPS units, telescopes, and other field research devices
6. Have a basic understanding of how to set up a chemical laboratory and adhere to OSHA and Laboratory Safe Standard best practices

D. Course Outcomes Assessment will include:
1. Pre-Class Online Evaluation
2. Classroom Participation
3. Field Exercises
4. Post-Class Online Evaluations

E. Course Content will include:
The content covered by this course will include general knowledge in the areas of biology, chemistry, geology, astronomy, anatomy and physiology, as well as detailed topics related to the development of a STEM based program for the classroom or school district.

Specific exercises may include (although not limited to):
1. Scientific observation and note-taking
2. Scientific interpretations
3. Scientific identifications (geological: rock types, formations, structures, etc,; biological: floral and faunal, ecological, etc.)
4. Vegetation transects
5. Topographic map reading and orientation
6. Geologic map reading
7. Stream profiling and streamflow analysis
8. Chemical and physical analysis of water and soil samples

9. Telescope usage, assembly and general maintenance
10. Fetal pig, sheep brain, and sheep heart dissections
11. Chemical laboratory safety and lab set up
12. Virtual labs and their application