University of Arkansas – Fort Smith
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General Syllabus

CHEM 44161 Laboratory Methods I

Credit Hours: 1 Lecture Hours: 0 Laboratory Hours: 3

Prerequisite: CHEM 27363/27261 Organic Chemistry II/Laboratory

Effective: 2019-2020

I. Course Information:

A. Catalog Description

Practical experience in planning and carrying out laboratory exercises and demonstrations to suit a variety of level of students. Students collaborate with instructors, peers and laboratory students. Class may be repeated for a total of two hours.

B. Additional Information

This course is intended for majors in the physical/earth science secondary education degree program. The intent is to provide the student with specific content area experience at a relatively early point in the pursuit of the degree. The class is very much a hands on experience with assignments that support those activities. If the class is repeated for credit it will be considered elective credit. If the class is repeated, effort will be made to ensure that the same activities, course and/or instructor are not reassigned.

II. Student Learning Outcomes

A. Subject Matter

Upon completion of this course, the student will be able to:

1. Evaluate specific areas of chemistry laboratory that students find particularly confusing or difficult to master.
2. Assess specific challenges that a laboratory teacher faces in assisting students in learning chemistry.
3. Evaluate observations of physical sciences laboratory students and propose multiple approaches to present concepts or laboratory exercises.

4. Assess a personal interpretation of a difficult concept for laboratory students in their study of physical sciences.
5. Apply and develop laboratory and demonstration experiences to aid students in the understanding of physical sciences.
6. Apply and connect content material to laboratory exercises and demonstrations.
7. Assess safety issues and appropriate procedures associated with laboratory experiments and demonstrations; practice recommended safety techniques.

B. University Learning Outcomes

Laboratory Method I enhances student abilities in the following general education areas:

Analytical Skills
Critical Thinking Skills: Students will identify a problem or issue and will research, evaluate, and compare information from varying sources in order to evaluate authority, accuracy, recency, and bias relevant to the problems/issues. The student will generate solutions/analysis of problems/issues evaluated and will assess and justify the solutions and/or analysis.

Communication Skills (written and oral)
Students will communicate proficiently. The student will compose coherent documents appropriate to the intended audience and effectively communicate orally in a public setting.

Ethical Decision Making
Students will model ethical decision-making processes. The students will identify ethical dilemmas and affected parties and will apply ethical frameworks to resolve a variety of ethical dilemmas.

Global & Cultural Perspectives
Students will reflect upon cultural differences and their implications for interacting with people from cultures other than their own. The students will demonstrate understanding or application of their discipline in a global environment and will demonstrate how their discipline impacts or is impacted by different cultures.

III. Major Course Topics:

A. Many of the basic topics in chemistry will be touched upon as the students explore and study laboratory techniques.
B. Learning styles of students in a laboratory situation.
C. Student-teacher relationships and interactions.
D. Multiple methods of approaching a concept or problem
E. Making connections between content and laboratory experiments and demonstrations.
F. Laboratory safety practices, safety consideration for demonstration, and sources of information on laboratory safety.