

University of Arkansas – Fort Smith
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General Syllabus

CHEM 1411 College Chemistry II Laboratory

Credit Hours: 1

Lecture Hours: 0

Laboratory Hours: 3

Prerequisite or corequisite: CHEM 1413 College Chemistry II

Effective: 2018~2019

I. Course Information

A. Catalog Description

Investigative experience in basic chemistry, covering introductory organic chemistry, chemical equilibrium, thermodynamics, solubility equilibria, kinetics, acid-base theory, and oxidation-reduction.

II. Student Learning Outcomes

A. Subject Matter

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

1. Observe the safety rules in a chemistry laboratory and demonstrate the ability to handle hazardous material and emergency situations.
2. Perform qualitative analysis of group I and group II cations.
3. Determine the formula of an unknown chemical substance.
4. Synthesize and analyze aspirin.
5. Determine chemical reaction rates.
6. Use Le Chatelier principle to determine the effects of various factors on chemical equilibrium.
7. Perform acid-base and EDTA titrations.
8. Determine the ion product constant, K_{sp} .

B. University Learning Outcomes

College Chemistry II Laboratory enhances student abilities in the following 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. Students 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. Students 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. 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. 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. The Rate of Chemical Reaction
- B. Introduction to Chemical Equilibrium
- C. Ionic Reactions
- D. Techniques of Chromatography
- E. Equilibria Between Ionic Solids and Ions
- F. Acid-Base Equilibria
- G. Ionization Constants of Weak Acids
- H. Volumetric Analysis
- I. Qualitative Analysis
- J. Electrochemistry
- K. Introductory Organic Chemistry
- L. Organic Synthesis