

University of Arkansas – Fort Smith  
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### **General Syllabus**

## **CHEM 3034 Descriptive Inorganic Chemistry**

Credit Hours: 4                      Lecture Hours: 3              Laboratory Hours: 3

Prerequisite: CHEM 1413/1411 College Chemistry II/Laboratory

Effective: 2018~2019

### **I. Course Information**

#### **A. Catalog Description**

Focus on descriptive inorganic chemistry, structures of small molecules, and bonding theories in inorganic compounds and complexes. Also, includes a survey of bioinorganic chemistry.

#### **B. Additional Information - None**

### **II. Student Learning Outcomes**

#### **A. Subject Matter**

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

1. Explain how elements are grouped in the Periodic Table and their relation of physical and chemical properties based on electronic structure.
2. Predict the formulation of main group inorganic molecules, their electronic structure, and their properties.
3. Account for extended structures, both ionic and molecular interactions between molecules.
4. Assess first row transition metals and special properties in bioinorganic and organometallic chemistry.

#### **B. University Learning Outcomes**

##### **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. An Introduction to Coordination Chemistry
- B. Structures of Coordination Compounds
- C. Bonding Theories for Coordination Compounds
- D. Building a Network of Ideas to Make Sense of the Periodic Table
- E. Hydrogen and Hydrides
- F. Oxygen, Aqueous Solutions, and the Acid Base Character of Oxides and Hydroxides
  - 1. Group 1A: The Alkali Metals
  - 2. Group 2A: The Alkaline Earth Metals
  - 3. The Group 3A: Elements
  - 4. The Group 4A Elements. Discovery and Isolation of the Elements
  - 5. Group 5A: The Pnictogens
- G. Sulfur, Selenium, Tellurium, and Polonium
- H. The Halogens: Discovery and Isolation of the Elements
  - 1. Group 8A: The Noble Gases
- I. Bioinorganic Chemistry (survey)