

Main Group Chemistry  
CHE 305 (1,0,1)  
Northern Kentucky University

Prerequisite: General Chemistry II, CHE 121

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Texts: MacKay, K.M, MacKay, R. A., Henderson, W. *Introduction to Modern Inorganic Chemistry*; Sixth Edition, Nelson Thornes Ltd., 2002

### Course Objectives

1. Review of electron configurations, Lewis formulas, VSEPR, acid-base theories, solubility of inorganic compounds, redox reactions
2. Discussion of trends in physical of main group elements (Group IA through VIIIA elements)
3. Discussion of reactions typical of the elements of each family or selected elements in each family
4. Discussion of important industrial reactions and syntheses

### Assignments

For each chapter you will be given a list of exercises and problems that are to be handed in on a given due date. You should use the exercises and problems as a test of your understanding of the material. Late assignments will normally not be accepted and will be assigned a grade of zero.

### Papers

Two short papers are required.

One paper related to Inorganic chemistry is to be selected from the following journals and must be approved by the instructor before the report is written.

- a) *Journal of Chemical Education*, **2000 - current**.
- b) *Angewandte Chemie International Edition*, **2000 - current**.
- c) *J. Am. Chem. Soc., Organometallics* or *Inorg. Chem.*, **2000 - current**.

A second paper is to be selected from a list of articles provided by the instructor.

### Tests

There will be one or two tests; one will be given during the final exam period. You will be expected to apply concepts, explain facts and theories, predict the outcomes of reactions, and outline a series of reactions that could be used to produce a desired compound from a given set of starting materials.

## Grading

Assignments	30% of overall score
Papers	20% of overall score
Tests	50% of overall score

<u>Overall Score</u>	<u>Letter Grade</u>
90 - 100%	A
80 - 89%	B
70 - 79%	C
60 - 69%	D
0 - 59%	F

## Tentative Schedule

Aug. 25	Review of Electron Configurations, Lewis Formulas, VSEPR Theory
Sept. 1	Review of Acid-Base Theories
Sept. 8	Review of Solubilities of Inorganic Compounds
Sept. 15	Redox Reactions
Sept. 22	Hydrogen and Its Reactions
Sept. 29	Group 1 Elements: Sources, Reactions, Compounds
Oct. 6	Group 2 Elements: Sources, Reactions, Compounds
Oct. 13	Mid-Term Test
Oct. 20	Group 13 Elements: Sources, Reactions, Compounds
Oct. 27	Group 14 Elements: Sources, Reactions, Compounds (Emphasis on Carbon and Silicon)
Nov. 3	Group 15 Elements: Sources, Reactions, Compounds
Nov. 10	Group 16 Elements: Sources, Reactions, Compounds
Nov. 17	Group 17 Elements: Sources, Reactions, Compounds
Nov. 24	Thanksgiving Break. No Class
Dec. 1	Group 18 Elements: Sources, Reactions, Compounds
Dec. 8	Structure of Metallic and Ionic Solids
Dec. 15	Final Exam

## Important Dates

August 25	First day of Class
October 13	Mid-Term Test
November 24	Thanksgiving Break. No Class
December 15	Final Exam, 10:10 – 12:10

### Policies of the Department of Chemistry at Northern Kentucky University

- All items on syllabi are subject to change by the instructor.
- Students are responsible for reading and understanding all items on the syllabi. Any items not understood must be brought to the attention of the instructor within the first two weeks of class.
- The work you will do in any course is subject to the Student Honor Code. The Honor Code is a commitment to the highest degree of ethical integrity in academic conduct, a commitment that, individually and collectively, the students of Northern Kentucky University will not lie, cheat, or plagiarize to gain an academic advantage over fellow students or avoid academic requirements. The Honor Code can be accessed at [http://www.nku.edu/~deanstudents/student\\_rights/honor\\_code/htm](http://www.nku.edu/~deanstudents/student_rights/honor_code/htm).
- Cheating will not be tolerated. In accordance with the Code of Student Rights and Responsibilities, faculty members have the right to determine actions to be taken when a student is caught cheating.
- Faculty members reserve the right to dismiss or to have removed a disruptive student from their classrooms.
- A grade of C or better is required in CHE 120 and CHE 120L to enter CHE 121 and CHE 121L.
- This is a web enhanced course. Students meet at regularly scheduled class time and will need access to the internet to fulfill course requirements.

### General Chemistry Withdrawal Policy

Any student withdrawing from either General Chemistry I (lecture) or General Chemistry Lab I must also withdraw from the other. Failure to do so will result in the department withdrawing the student from both lecture and lab.

### Cheating

Students caught cheating or plagiarizing for the first time will receive a grade of zero for that test or assignment. Students caught cheating or plagiarizing a second time will receive an F for the course and will be reported to the Dean of Students.

### Cell Phones

Students are asked to turn off their cell phones during class. If you expect an emergency call please notify your instructor. Under no circumstance will students be allowed to use their cell phones during a test. Using a cell phone during a test will be considered cheating.

### Students with Disabilities

Students with disabilities who require accommodations (academic adjustments, auxiliary aids or services) for this course must register with the Disability Services Office. Please contact the Disability Service Office immediately in the University Center, Suite 320 or call 859-572-6373 for more information. Verification of your disability is required in the Disability Services Office for you to receive reasonable academic accommodations. Visit the Disability Services website at [www.nku.edu/~disability/](http://www.nku.edu/~disability/).