

Inorganic Chemistry
CHEM 4761 / 7761G
Spring Semester 2018
01/29/18 – 05/16/18

- Prerequisites: CHEM 3410 or CHEM 3415W and PHY 2100 or 2150
- Instructor: Professor Brian R. Gibney 2411 Ingersoll
(718) 951-5600 x6636 bgibney@brooklyn.cuny.edu
- Required Text: *Shriver & Atkins Inorganic Chemistry*, 6th edition, Overton, Rourke, Weller, Armstrong, Oxford University Press, New York, 2015
- Recommended Text *Molecular Symmetry and Group Theory: A Programmed Introduction to Chemical Applications*, 2nd edition, Alan Vincent, Wiley, New York, 2001
- Scheduled Lectures: M-W 9:10 - 10:25
- Office Hours: M 12:00 – 1:00 pm
- Course Materials: In addition to the text, selected articles from the original scientific literature will be assigned. Articles will be available at the course website.
- Course Website <http://www.chemist.nyc/Inorganic/Spring2018.php> (case sensitive)
- Course Goals: The goal of this course is to enable the students to fully understand the underlying principles in modern Inorganic Chemistry which deals with the properties of all the elements of the periodic table. Student will develop an appreciation for the breadth and depth of Inorganic Chemistry as they read and critically evaluate the primary literature. Since inorganic compounds provide the most significant challenges to concepts of structure and bonding in chemistry, students will learn to apply group theory as the basis for developing molecular orbital theory required to understand chemical bonding. Students will also learn modern spectroscopic techniques to qualitatively and quantitatively understand electronic structure which provides the rigorous tests of molecular orbital theory. With a solid foundation in electronic structure and bonding, students will develop an understanding of the relationship between them and chemical reactivity. Students will learn about the application of these principles to modern chemical catalysis, bioinorganic chemistry, solid-state chemistry and nanoscience.
- Assignments: Homework exercises from the text will be given and the solutions posted the following week. Homework is not collected or graded, however professionalism demands that you keep current with the homework and reading assignments. I am not here to spoon feed you exam information.

The homework will serve as an indication as to the type and level of difficulty of the questions/problems that you will find on the exams.

Grading:

There will be two one-hour exams and one two-hour cumulative final examination. Each hour exam is worth 25% of your grade, the final is worth 50% of your grade. The final grade may be curved.

- 90 -100% A
- 80 -89% B
- 70 -79% C
- 60 -69% D
- below 60% F

As per department policy, any request for an examination regrade must be made in writing using the form available on the Department website.

Academic Honesty

Academic dishonesty will not be tolerated in any form. Evidence of cheating on exams, or copying of lab reports will result in a failing grade for the course, without exception. The CUNY policy on Academic Integrity can be found at:

http://www.cuny.edu/about/administration/offices/la/Academic_Integrity_Policy.pdf

Course Topics:

Chapters 1-6

Origin of elements

Atomic structure

Molecular structure and bonding

Molecular symmetry

Exam I

Chapters 7, 13, 14

Acid/Base chemistry

Redox chemistry

d-Metal complexes

Crystal Field and Ligand Field theories

Magnetism

Exam II

Chapters 15-17, 19

Electronic spectroscopy

Ligand substitution reactions

Electron transfer theory

Organometallic chemistry

Bioinorganic chemistry

Final Exam