

Chemical Bonding, 001:160:361
Fall, 2016
Syllabus – September 17, 2016

Subject

Theories of ionic and covalent bonding. Elementary molecular orbital theory applied to simple molecules. This course is intended primarily for students majoring or minoring in Chemistry and is a pre-requisite for Inorganic Chemistry, 01:160:371. A second semester of calculus is a pre-requisite. Although the use of calculus is minimal, students who are not familiar with the basics of partial differentiation and the use of different coordinate systems may find themselves at a disadvantage in understanding some of the material.

Meeting dates

Seven weeks of class meetings begin Wednesday, September 7. A detailed schedule is given in the table below.

Meeting times and places

Wednesdays, 12:00 – 1:20 PM; Hill 116

Fridays, 1:40 -3:00 PM; Pharmacy 111

Instructor

Gregory Herzog; 280 Rieman; herzog@rutchem.rutgers.edu (848 445 3955)

Office hours: M, T, Th 4:45 pm – 5:45 pm; F 3:45-4:45 pm.

Class schedule

Class	Lec	Day	Date	Activity	HW	Reading	Topics
1	1	W	9/7	Lecture 1	1	1.1-2	Origin of the elements
2	2	F	9/9	Lecture 2, Quiz 1	2	1.3-5	Hydrogen and hydrogen-like atoms
3	3	W	9/14	Lecture 3	3	1.6-8	Many-electron atoms
4	4	F	9/16	Lecture 4, HW 2	4	1.9	Electronegativity
5	5	W	9/21	Lecture 5	5	2.1	Lewis structures, bond energies
6	6	F	9/23	Lecture 6, Quiz 3	6	2.2	VSEPR
7	7	W	9/28	Lecture 7	7	2.4-6	VB theory of diatomics
		F	9/30	Exam 1			All topics for lectures 1-6
8		W	10/5	Lecture 8	8	2.6-11	MO theory of diatomics
9	8	F	10/7	Lecture 9, Quiz 4	9	3.1-3.11	Solids; metals; ionic compounds
10	9	W	10/12	Lecture 10	10	6.1	Introduction to symmetry
11	10	F	10/14	Lecture 11, HW 10	11	6.2-4	Symmetry applications, I
12	11	W	10/19	Lecture 12	12	6.6-7	Symmetry applications, II
13	12	F	10/21	Lecture 13, Quiz 6	13		Hydrogen bonding
14	13	W	10/26	Optional review			
		F	10/28	Exam 2			All topics for lectures 7-13

†Upon request and with written justification, a student may take a make-up for one or both of the hourly examinations during the regularly scheduled final examination period.

Textbook

Inorganic Chemistry, 6th Edition (2014) Shriver, Weller, Overton, Rourke, and Armstrong. Freeman (US); \$162 on the Freeman website. A British edition is available from Oxford Univ. Press (UK) for 50£, about \$75 US plus shipping, *if they'll ship it*; commercial agreements may interfere.

Homework assignments:

Homework assignments are indicated in the table above in the column labeled "HW," and can be found in the Resources section of the Sakai website. Only two homework assignments, HW 2 and HW 10, will be collected and graded - but problems very much like the ones on the other assignments will appear on the quizzes and examinations.

Quizzes and Examinations

Quizzes will be given at the beginning of the hour and last about twenty minutes. The first quiz will be based closely on the notes of Lecture 1; subsequent quizzes will be based on the notes and/or the problems assigned for the previous two lectures. For example, the quiz for September 23 will be based on lectures 4 and 5 and homework assignments 4 and 5.

The class has two 80-minute examinations, which are scheduled for Friday, 9/30 and Friday, 10/28. Please plan to attend if at all possible.

Additional information about the content of the quizzes and exams will be posted in "Announcements" on the Sakai website.

Make-up(s) missed hourly examination(s):

With persuasive, written, signed excuses (*no e-mail*), students may take a make-up examination for Exam 1, or Exam 2, or both. The two 80-minute make-up exams will be scheduled during the regular, 3-hour final examination period. While laudable, a wish to improve an exam score is not a persuasive reason for taking a make-up.

Grading

Quizzes/Homework (best 5 of 6), 50 points; lowest of 6 scores will be dropped. No make-ups. With persuasive, written, signed excuses (*no e-mail*), additional missed quizzes may be dropped and other scores averaged.

Exam 1, 100 points

Exam 2, 100 points; not cumulative.

Academic integrity

The usual rules apply (<http://ctaar.rutgers.edu/integrity/policy.html>).