

CHEMISTRY 520A SYLLABUS
ADVANCED INORGANIC
CHEMISTRY Fall 2022

MWF 10:00-10:50 AM
GMCS 314

Instructor: Dr. Yong Yan
Office: GMCS 213F or CSL407
Office Hours: MWF 10:50-11:50 AM

Text: Class materials (New Textbook chapters, written by Dr. Yan) will be distributed during the lectures as class materials. NOTE: Cengage-OWLv2 will be used in Chem 520A for Fall 2022
Optional "Inorganic Chemistry," Weller *et al.* Oxford 7th edition
Optional "The Organometallic Chemistry of the Transition Metals" 6th Edition, Crabtree
Also optional "Molecular Symmetry and Group Theory", Vincent

Topics to be covered and relevant chapters in Weller:

Chap. 1 & 20.6	Atomic structure and Electron Configuration
Chap. 2	Simple Bonding Approaches and Molecular Orbital Theory
Chap. 3	Symmetry and Applications of Group Theory
Chap 6	Oxidation and Reduction
Chap. 7.11 &19	Coordination Chemistry I: Structures and Catalysis
Chap. 7 &20	Coordination Chemistry II: Bonding and Spectroscopy
Chap. 4	The Solid State Chemistry and Physical Techniques

DEI statement: The Dept. Chemistry&Biochemistry embraces a notion of intellectual community enriched and enhanced by diversity along a number of dimensions, including race, ethnicity and national origins, gender and gender identity, sexuality, class and religion.

Expected Student Learning Outcomes:

- a) To be able to predict using the appropriate theories, the bonding, spectroscopic, and magnetic properties of inorganic complexes.
- b) To be able to determine the symmetry of molecules and to utilize the chemical applications of Group Theory.
- c) To understand and be able to predict the behavior of elements from their position in the periodic table.
- d) To understand and be able to predict the unique properties of transition metal complexes.

There will be two in-class exams in this course *tentatively* scheduled for October 10th and

November 14th with a final on Friday December 16th (Final date may change according to the availability of the room). The hour exams count 30% each and the final 40%.

Other useful (possibly) information:

1. NO attendance required, but do not miss any class. Contact me first if you have to miss or reschedule an exam. It is extremely important to avoid any miscommunication.
2. Since a prerequisite for this course is Chem 410A (P-Chem) I expect that you will know this material. Chapters 1 and 2 in your text are examples of material you should be familiar with and which I will not go over explicitly. If you are unfamiliar with, or have forgotten this knowledge, I recommend you read Chap. 1 and 2 and/or your P-Chem text. Other areas, which I expect you will at least be partially familiar with, are the chapters on covalent bonding and M.O. Theory. Note also that while previous catalogs stated "credit or concurrent registration in Chemistry 410A" as a prerequisite for this course, concurrent registration is in fact no longer sufficient. **You must have COMPLETED Chemistry 410A with a passing grade. Over 80% of those taking this class and 410A concurrently failed; therefore the p-chem prerequisite is strictly enforced!**
3. You will find that I do not lecture directly out of your text. It is just one of the varieties of source materials that I use. Thus, the exams will not necessarily be based on only textual materials, *i.e.* your notes are important, read them! It should also be obvious that regular attendance in class will be important, although I do not take role of any kind. It is your money! You may find it helpful to do the problems at the end of each chapter; however, I will not assign or collect these. Copies of old exams (or Cengage practice exams) will be distributed to you prior to examination dates to give you an idea of what to expect (to be forewarned is to be forearmed).
4. Chemistry 520A is truly a senior chemistry capstone class, since, although we concentrate on inorganic compounds, we bring in advanced material from analytical, physical and organic as well. **Most students find this class one of the two most challenging of their career at SDSU (the other being P-Chem).** Therefore do not get behind or you will never catch up. We cover lots of material and move rapidly at times.
5. In-class quiz will be conducted but may not be counted for your final grade. This quiz is designed with book closed but can be conducted with a bundled group. Discussions are allowed and encouraged. **Therefore forming a study group is necessary, particularly on group theory and molecular orbital theory.** The quiz materials are candidate pool for you to prepared your exams. Extra credits may be considered under particular circumstance.
6. **Grading Policies:** Your grade will be determined at the end of the semester, which will not be based on a curve thus your performance will not be affected by others. There is no pre-determined guideline for the grade distribution and most students are assigned the high possible course grades in the end. However, high grades will require a lot of focus, dedication and understanding of the advanced course material. The following flexible scale is a guideline: 80% for "A", 70% for "B" and 60% for a "C" grade, 50% for "D", below 40% for "F" respectively. The +/- grades will be at the instructor's discretion. GOOD LUCK!