

**CHEMISTRY 520A SYLLABUS**  
**ADVANCED INORGANIC CHEMISTRY**  
**Fall 2021**

MWF 10:00-10:50 AM  
GMCS 314

Instructor: Dr. Carl Carrano  
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**General:** This may turn out to be a difficult semester both for you as students and myself as instructor as the guidelines for in person classes is in constant flux. As of now the procedure will be as follows: I have available on Canvas and elsewhere my video captured lectures from last year. These will take the place of regular lectures in GMCS 314 at the scheduled class time. Thus, you may view the lectures at any time convenient for you rather than being limited to attending lectures during regularly scheduled class time. Please note that some of the non-technical announcements such as exact dates for exams etc. will be dated. Do NOT follow these as they are from last year. Check Canvas for the updated information related to this year. After the first week, when I need everyone to attend the regular scheduled class time and place, I will not be presenting lectures rather I will be available in GMCS 314 at the scheduled class time as an extended form of office hours and help session. Since this is the regular class time everyone should be able to attend any of these without time conflicts. Note that you are NOT required to attend these sessions except the first week. Any needed communication, as for example the schedule of exams etc., I will provide via Canvas. Thus, if you do not come during class time it is imperative that you check Canvas every day for new handouts, announcements etc. I am not sure yet how we will administer exams this fall whether in class (GMCS 314) as in the “old days” or as we did last Fall when they were posted on Canvas(Blackboard actually then) with a set number of hours to complete and return to me via email.

**In class COVID related requirements:** First, all students are required to be vaccinated. Additionally all students attending class indoors must wear a mask, vaccinated or not. In order for me to be heard however, I myself may not always be masked. Please see the University COVID website for the latest requirements/changes etc.

**Optional Text:** “Inorganic Chemistry,” Housecroft and Sharpe  
Website: [www.pearsoned.co.uk/housecroft](http://www.pearsoned.co.uk/housecroft) Features multiple choice questions and rotatable 3D molecular structures. However any general advanced Inorganic textbook can be used as the text is purely optional and a supplement to my lectures. Everything you need to know will be presented in lecture. A book is only for reinforcement and alternative ways of explaining certain concepts. Also optional but highly recommended is “Molecular Symmetry and Group Theory” by Alan Vincent

Topics to be covered and relevant chapters using Housecroft as an example:

Chap. 1 & 20.6      Review of Quantum Mechanics

Chap. 2	Simple Bonding Approaches and Molecular Orbital Theory
Chap. 3	Symmetry and Applications of Group Theory
Chap 5	Bonding in Polyatomic Molecules
Chap. 7.11 &19	Coordination Chemistry I: Structures
Chap. 20	Coordination Chemistry II & III: Bonding and Spectroscopy
	Coordination Chemistry IV Magnetism
Chap. 6	The Solid State

Expected Student Learning Outcomes:

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

There will be two midterm exams in this course *tentatively* scheduled for October 11th and November 15th with a COMPREHENSIVE final TBA.

The hour exams count 25% each and the final 50%.

Other useful (possibly) information:

- Since a prerequisite for this course is Chem 410A (the Quantum part of 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!**

2. You will find that I do not lecture directly out of any text. It is just one of the varieties of source materials that I use. Thus, the exams are not based on specific textual materials, i.e. **everything you are expected to know is presented in lecture** thus your notes are the most important, read them! It should also be obvious that actually viewing and reviewing the uploaded lectures 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 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).
3. 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. GOOD LUCK!