

Imperial Valley College Course Syllabus – Chemistry 202 General Inorganic Chemistry II

Basic Course Information

Semester	Spring 2015	Instructor Name	Dr. James Fisher
Course Title & #	Chemistry 202 General Inorganic Chemistry II	Email	jim.fisher@imperial.edu
CRN #	20868	Webpage	http://faculty.imperial.edu/jim.fisher
Room	2716	Office	2771
Class Dates	17-Feb-15 to 12-Jun-15	Office Hours	Office Hours: Mon, Wed: 8:45-10:15 and Tue, Thur: 1-1:30. Alternate Office Hours: Friday 9:45-10:15.
Class Days	Monday, Wednesday, Friday	Office Phone #	(760) 355 6524 (ext-6524)
Class Times	10:15-1:20 PM	Office contact if student will be out or emergency	Department Secretary 760-355-6155
Units	5		

Course Description

This course includes a detailed study of chemical reaction rates, the equilibrium condition as it applies to acids and bases as well as solubility, thermodynamics and the properties of spontaneous reactions, electrochemistry, chemistry of the transition elements, and nuclear processes. A survey of topics in organic chemistry and biochemistry is also included. This is the second course of the chemistry series. (C-ID CHEM 120S) (CSU, UC)

Student Learning Outcomes

Upon course completion, the successful student will have acquired new skills, knowledge, and or attitudes as demonstrated by being able to:

1. Examine and develop concepts of covalent bonding, orbital hybridization and molecular orbital theory. (ISLO4)
2. Identify and perform organic addition and elimination reactions. (ISLO2)
3. Compare and analyze Thermodynamics properties and differentiate between spontaneity and maximum useful work heat and Free energy. (ISLO2)
4. Develop ideas of Chemical Kinetics from experiments using concentration dependence then determining rates and rate law. (ISLO4)
5. Recognize oxidation-reduction reactions in electrolytic cells, sacrificial anodes, the use of the Nernst equation, and how to balancing red-ox reactions. (ISLO2)

Course Objectives

Upon satisfactory completion of the course, students will be able to:

1. demonstrate knowledge of bonding as related to atomic orbital, valence bond and molecular orbital theory, what a sigma and pi bond are, how to determine a bonding versus anti bonding orbital, what is paramagnetism, and the theory of bonding in metallic bonds.
2. Demonstrate knowledge of Organic Chemistry, learn the difference between addition and elimination reactions, Markovnikov's Rule, the difference between Functional Groups Elimination and how to make polymers.
3. Relate the general concepts of thermodynamics, describe the difference between the 1st law, 2nd law, and 3rd law's, how to determine entropy changes, calculate maximum useful work, and free energy.
4. Manipulate various Chemical Kinetics equations, understand the effects of concentration, temperature and catalysts in the rate of a chemical equation, write rate expressions, use related rates to find rate

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constants, calculate using Arrhenius Equation, and determine how to write rate expressions from elementary reaction steps.

5. Relate general concepts of oxidation-reduction reactions, balancing ox-red reactions, how to construct galvanic and electrolytic cells, how to use the Nernst equation, calculate spontaneity of reactions, and learn corrosion processes as well as how to prevent corrosion.
6. Write nuclear reactions, learn what natural and artificial radioactivity, how to write rate of decay, formulas, and the difference between fission and fusion.
7. Manipulate various intermolecular forces equations, how to apply concepts of gases, liquids, and solids, as they apply to phase changes and phase diagrams, different crystalline solids and unit cell calculations.
8. Demonstrate knowledge of a survey of elements including Main Group and Transition metals, industrial preparation of common molecules such as Nitric acid using Ostwald process, chlorine, sodium, magnesium, and copper, and iron, what is ozone chemistry, what coordination chemistry is, identify common ligands, how to name coordination compounds, draw isomers, and how Crystal Field Theory applies to colors.

Textbooks & Other Required Material

1. Textbook: *Chemical Principles: The Quest for Insight*. Peter Atkins, Loretta Jones. 6th ed. W. H. Freeman (2012)
2. Lab Manuals: *General Chemistry on the Laboratory*; Postma et al, 7th ed. 2009
3. Supplemental Lab Manual: *Chemistry 202 Laboratory Packet*; is purchased from the Chemistry club
4. Safety Glasses or Goggles: must be acid and heat resistant. These must comply with:
 - a. Meet ANSI* Z87.1-2003 standards.
 - b. Polycarbonate lens
 - c. Wraparound protection offers a wide field of vision
5. Non programmable Calculator: a highly recommended calculator is the Texas Instruments TI36X Solar Scientific Calculator (not the "Pro") or the TI-30Xa.
6. Scranton for your final exam an 882-E, for 100 answers.

Course Requirements and Instructional Methods

- **Lecture Quizzes:** A short quiz on lecture material will periodically be given at the beginning of class. Quizzes are worth 5-15 points each with **no makeup** quizzes allowed. Quizzes will not be given on lecture exam days.
- **Lecture Exams:** Under normal circumstances (**Fall, Spring**), there will be 6 exams. No **make-up** exams. Exams will be graded and then returned as soon as possible. During the **Summer** or **Winter** sessions, only 5 exams are given.
- **Safety** in the laboratory is of utmost importance - those who do not follow the outlined safety procedures will have points deducted from their lab score or asked to leave the lab during that lab. Closed toed shoes and goggle are required.
- **Laboratory:** All experiments are required to be prepared as **formal lab write-ups** as described in the lab notebook handout (which you will receive in class). The core of the write-up in your notebook will include the title, objective, and procedures, and must be done **prior** to the start of the lab. In order to begin an experiment, the instructor must initial the pre-lab. This is necessary to insure safety in the lab. In addition, each lab experiment will require a data, calculations, and discussion write-up that is completed in your lab notebook. There are no lab make-ups. Unless otherwise instructed, each student will work on experiments individually.

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- **Lab Notebook:** You will not be allowed to start an experiment until the Prelab is completed and checked. Experiments are due as directed, late experiments are acceptable with a *loss of points (one point per lab point)* up to the lab before the lab exam. Your lab notebook can be used on lab exams.
- **Completed** experimental lab write-ups are due the following lab meeting however if there are problems with calculations a second lab day is allowed for turning labs in for grading, unless it is lab exam day at which point the lab notebooks are due and a second grace day is not allowed. After that **1 pt will be lost per lab day late**. NOTE, the definition of a Lab Day is at the end of the Lab period since labs are ONLY graded during lab, and never between labs; in other words the next lab day starts at the end of that day lab or any lab graded after that lab is officially over is considered the next lab day. Lab notebooks are handed in after each lab exam to get a tally of points, however ungraded labs are considered late on lab exam day.
- **Lab Exams:** Lab exams will contain problems and/or explanation type questions based on the preceding laboratory experiments. Your Lab Notebook can be used during the Lab Exams. There are 3 Lab exams each of which count toward your course grade. No Make-up Lab exams will be allowed. This Point Total is added to your Lecture Score to obtain a total score that includes both the lecture and lab component of this class.
- **Lab Cleanup** The entire class will lose points if the sinks, scales, hoods, floor are not clean, chemical caps not screwed back on, and chairs not put in place. The class can lose up to 10 points.
- **Final Exam:** The Final Exam is comprehensive. Final exam questions are in multiple-choice format. You must purchase a 882-E, 50 questions per side, Scranton for the Final Exam. There are **no make-ups** because the date and time of the Final is the last day of class.
- **You must** (1) remember your locker combination-after locker check-in, (2) bring goggle or eye safety glasses, (3) closed toed shoes to be in the lab; you are not furnished these and (4) calculators for exams. Forgetting to do so will cost you 5 points.

Good students plan are aware of their strengths and weaknesses

- **Study Hints:** Chemistry is a very demanding course. Depending on your background, you will need to spend 1-4 hours outside of lab to get your work done. Missing a lecture usually means your grade falls by $\frac{1}{2}$ grade.
- **Falling behind will be disastrous.**
- **No Gifts, cards, or food. All will be refused. Spend your time and effort studying.**
- **Don't try to cram! It doesn't work.**
- **Sometimes it helps to form a study group.**
- **Keep up!!**

Course Grading Based on Course Objectives

Exams	6 @ 100	600 pts
Labs	14 @ 10	140 pts
Lab Cleanup	14@-10	("-" points lost if necessary)
Lab Exams	3@ 100	300 pts
Locker Checkout		20 pts
Final Exam		240 pts
TOTAL (about)		≈1350 pts

Letter grades will be assigned based upon the % of points earned: Grading scale, A: 90-100%; B: 80-89%, C: 70-79%, D: 60-69, F: <59.

Attendance

- A student who fails to attend the first meeting of a class or does not complete the first mandatory activity of an online class will be dropped by the instructor as of the first official meeting of that class. Should readmission be desired, the student's status will be the same as that of any other student who desires to add a class. It is the student's responsibility to drop or officially withdraw from the class. See General Catalog for details.
- **Regular attendance** in all classes is expected of all students. A student whose continuous, unexcused absences exceed the number of hours the class is scheduled to meet per week may be dropped.
- **Lecture Attendance** is recorded. Students are expected to attend every class session. Any student who misses the first class will be dropped. Students may be dropped at instructor discretion if they miss more than a week of class hours continuously (3 hours).
- **Lab Attendance** is recorded just as lecture attendance. **If you miss the safety or introduction of the lab, you will not be able to attend that lab, and there are not lab makeups. You will receive no points for a lab you miss. Two (2) unexcused absences and you will be dropped. You may be asked to have your lab signed by the Instructor, at the beginning and end of the lab to receive any credit. Since Closed Toed Shoes are mandatory for Lab, not having closed toed shoes will not count as an absence, and you will NOT receive credit for the lab. Locker checkout counts as 2 labs or 20 points.**
- Absences attributed to the representation of the college at officially approved events (conferences, contests, and field trips) will be counted as 'excused' absences.

Classroom Etiquette

- **Removal of students**, by the Instructor, for "good cause" either temporary or permanent is found in California Education Code Section 76030-76307. Definition of Good Cause including but not limited to: Continued disrupted behavior, continued willful disobedience...open and persistent defiance of the authority...
- This is a college classroom; disruptive or disrespectful behavior will not be tolerated. It is NOT OK to be late, sleep, talk, and whisper during class or do homework for another class. Class will end on time, so do not pack up early and disrupt the class.
- Leaving during lecture or lab is considered an unexcused absence. If you have to leave anytime during class, other than established break times, you must inform your instructor.
- Electronic Devices: Cell phones and electronic devices must be turned off and put away during class unless otherwise directed by the instructor.
- Food and Drink are prohibited in all classrooms. Water bottles with lids/caps are the only exception. Additional restrictions will apply in labs. Please comply as directed.
- Disruptive Students: Students who disrupt or interfere with a class may be sent out of the room and told to meet with the Campus Disciplinary Officer before returning to continue with coursework. Disciplinary procedures will be followed as outlined in the General Catalog.
- Children in the classroom: Due to college rules and state laws, no one who is not enrolled in the class may attend, including children.

Academic Honesty

- **Plagiarism** is to take and present as one's own the writings or ideas of others, without citing the source. You should understand the concept of plagiarism and keep it in mind when taking exams and preparing written materials. If you do not understand how to correctly 'cite a source', you must ask for help.
- **Cheating** is defined as fraud, deceit, or dishonesty in an academic assignment or using or attempting to use materials, or assisting others in using materials, or assisting others in using materials, which are prohibited or inappropriate in the context of the academic assignment in question.
- Anyone caught cheating or will receive a zero (0) on the exam or assignment, and the instructor may report the incident to the Campus Disciplinary Officer, who may place related documentation in a file. Repeated acts of cheating may result in an F in the course and/or disciplinary action. Please refer to the General School Catalog for more information on academic dishonesty or other misconduct. Acts of cheating include, but are not limited to the following: (a) plagiarism; (b) copying or attempting to copy from others during an examination or on an assignment ;(c) communicating test information with another person during an examination; (d) allowing others to do an assignment or portion of an assignment, (e) use of a commercial term paper service

Additional Help – Discretionary Section and Language

- **Blackboard** support center: <http://bbcrm.edusupportcenter.com/ics/support/default.asp?deptID=8543>
- **Learning Labs:** There are several 'labs' on campus to assist you through the use of computers, tutors, or a combination. Please consult your college map for the Math Lab, Reading & Writing Lab, and Learning Services (library). Please speak to the instructor about labs unique to your specific program
- **Library Services:** There is more to our library than just books. You have access to tutors in the learning center, study rooms for small groups, and online access to a wealth of resources.

Disabled Student Programs and Services (DSPS)

Any student with a documented disability who may need educational accommodations should notify the instructor or the Disabled Student Programs and Services (DSP&S) office as soon as possible. The DSP&S office is located in Building 2100, telephone 760-355-6313 if you feel you need to be evaluated for educational accommodations.

Student Counseling and Health Services

Students have counseling and health services available, provided by the pre-paid Student Health Fee. We now also have a fulltime mental health counselor. For information see <http://www.imperial.edu/students/student-health-center/>. The IVC Student Health Center is located in the Health Science building in Room 2109, telephone 760-355-6310.

Student Rights and Responsibilities

Students have the right to experience a positive learning environment and due process. For further information regarding student rights and responsibilities please refer to the IVC General Catalog available online at http://www.imperial.edu/index.php?option=com_docman&task=doc_download&gid=4516&Itemid=762

Information Literacy

Imperial Valley College is dedicated to help students skillfully discover, evaluate, and use information from all sources. Students can access tutorials at <http://www.imperial.edu/courses-and-programs/divisions/arts-and-letters/library-department/info-lit-tutorials/>

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Anticipated Class Schedule / Calendar

WK	DATE	LECTURE (MONDAY)	LABORATORY (WEDNESDAY)	LABORATORY (FRIDAY)
1	02-16	LINCOLN'S BD	Ch 3	Intro, Safety, Lockers
2	02-23	Ch 3, 4	MB: Lewis Structures	M-19: VSEPR and Orbital Hybridization
3	03-02	Ch 4, 6	M-21: Heat of Vapor/Fusion	Lecture Exam 1
4	03-09	Ch 6	M-15 Enthalpy Changes, Hess's Law	HOLIDAY
5	03-16	Ch 7	Lab Exam 1	Lecture Exam 2
6	03-23	Ch 9	IVC-14: Melting Point	M-22: Freezing Point
7	03-30	Ch 9, 10	M-36: Electrochemical cells	Lecture Exam 3
SPRING BREAK 04-06-15 thru 04-11-15				
8	04-13	Ch 14	IVC-23: Electrolysis	M-26: Rate of a chemical reaction
9	04-20	Ch 15	IVC-21: Kinetics	IVC-21: Kinetics
10	04-27	Ch 16	Lab Exam 2	Lecture Exam 4
11	05-04	Ch 17	IVC-24/M-43: Nuclear Radiation	IVC-25 Complex Ions
12	05-11	Ch 18	IVC-25 Complex Ions	Lecture Exam 5
13	05-18	Ch 19	IVC-16: Intro to Organic Chemistry	M-20: Gel Slim, Polymers
14	05-25	MEMORIAL DAY	IVC-15: Organic Chemistry	IVC-15: Organic Chemistry/Locker
15	06-01	Ch 20	Lab Exam 3	Lecture Exam 6
16	06-08		FINAL EXAM	