

**Basic Course Information**

Semester:	<b>Spring 2018</b>	Instructor Name:	<b>Dr. James Fisher</b>
Course Title & #:	<b>Chemistry 202 General Inorganic Chemistry II</b>	Email:	<b>jim.fisher@imperial.edu</b>
CRN #:	<b>10056</b>	Webpage (optional):	<b>http://faculty.imperial.edu/jim.fisher</b>
Classroom:	<b>2716</b>	Office #:	<b>2771</b>
Class Dates:	<b>2/12/18-6/8/18</b>	Office Hours:	<b>MWF 7:30-8:00AM and MWF 1:30-2:00PM</b>
Class Days:	<b>MWF</b>	Office Phone #:	<b>760-355-6524</b>
Class Times:	<b>2:00-5:10PM</b>	Emergency Contact:	<b>Department Secretary 760-355-6155</b>
Units:	<b>5</b>		

**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 verses 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 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 Resources or Links

1. Textbook: [Chemistry](https://openstax.org/details/chemistry). Paul Flowers, Klaus Theopold, Richard Langley. 1st ed. Openstax (2016) <<https://openstax.org/details/chemistry>>
1. Lab Manuals: [General Chemistry on the Laboratory](#); Postma et al, 7th ed. 2009
2. Supplemental Lab Manual: [Chemistry 202 Laboratory Packet](#); purchase from the Chem/STEM club
3. 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
4. Non programmable Calculator: a highly recommended calculator is the Texas Instruments TI36X Solar Scientific Calculator (not the "Pro") or the TI-30Xa.
5. 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.
- **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 Fall and Spring but only 2 Lab exams during Winter and Summer, 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 per lab.
- **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.

Out of Class Assignments: The Department of Education policy states that one (1) credit hour is the amount of student work that reasonably approximates not less than one hour of class time and two (2) hours of out-of-class time per week over the span of a semester. WASC has adopted a similar requirement.

### Course Grading Based on Course Objectives

- **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 ½ grade.
- **Do not fall behind so:**
  - Go to office hours
  - Get a tutor
  - Form study groups
- **No Gifts, cards, or food. All will be refused. Spend your time and effort studying.**
- **Don't try to cram! It doesn't work.**
- **Keep up!!**

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.

### Peer Led Team Learning (PLTL)

- Peer-Led Team Learning (PLTL) is a nationally recognized model of teaching and learning that originated in a chemistry course at the City College of New York in 1991. PLTL consist of a group leader and small group of students. The group leader, or peer-leader, is a student who has already successfully taken the class and was recruited to be a peer-leaders. Each week, the peer-leaders meets with their group to engage in problem solving and discussion of course material designed by the instructor. The PLTL model has been adapted by many institutions nationwide across all STEM disciplines, and an extensive body of research has demonstrated that PLTL improves student learning.
- PLTL Leaders Days and Room number: TBA

### 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 absence exceed the number of hours the class is scheduled to meet per week may be dropped; Chemistry 100, four units, is six hours and all other Chemistry courses, five units,**

**is nine hours.** For online courses, students who fail to complete required activities for two consecutive weeks may be considered to have excessive absences and may be dropped.

- **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

- 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 by the instructor.
- 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.

### Online Netiquette

- What is netiquette? Netiquette is internet manners, online etiquette, and digital etiquette all rolled into one word. Basically, netiquette is a set of rules for behaving properly online.
- Students are to comply with the following rules of netiquette: (1) identify yourself, (2) include a subject line, (3) avoid sarcasm, (4) respect others’ opinions and privacy, (5) acknowledge and return messages promptly, (6) copy with caution, (7) do not spam or junk mail, (8) be concise, (9) use appropriate language, (10) use appropriate emoticons (emotional icons) to help convey meaning, and (11) use appropriate intensifiers to help convey meaning [do not use ALL CAPS or multiple exclamation marks (!!!!)].

### Academic Honesty

Academic honesty in the advancement of knowledge requires that all students and instructors respect the integrity of one another’s work and recognize the important of acknowledging and safeguarding intellectual property.

There are many different forms of academic dishonesty. The following kinds of honesty violations and their definitions are not meant to be exhaustive. Rather, they are intended to serve as examples of unacceptable academic conduct.

- Plagiarism is taking and presenting 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 “cite a source” correctly, 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 that are prohibited or inappropriate in the context of the academic assignment in question.

Anyone caught cheating or plagiarizing 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 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) using a commercial term paper service.

### **Additional Student Services**

Imperial Valley College offers various services in support of student success. The following are some of the services available for students. Please speak to your instructor about additional services which may be available.

- **CANVAS LMS.** Canvas is Imperial Valley College’s main Learning Management System. To log onto Canvas, use this link: [Canvas Student Login](#). The [Canvas Student Guides Site](#) provides a variety of support available to students 24 hours per day. Additionally, a 24/7 Canvas Support Hotline is available for students to use: 877-893-9853.
- **Learning Services.** There are several learning labs on campus to assist students through the use of computers and tutors. Please consult your [Campus Map](#) for the [Math Lab](#); [Reading, Writing & Language Labs](#); and the [Study Skills Center](#).
- **Library Services.** There is more to our library than just books. You have access to tutors in the [Study Skills 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. Please contact them 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.

- **Student Health Center.** A Student Health Nurse is available on campus. In addition, Pioneers Memorial Healthcare District provide basic health services for students, such as first aid and care for minor illnesses. Contact the IVC [Student Health Center](#) at 760-355-6128 in Room 1536 for more information.
- **Mental Health Counseling Services.** Short-term individual, couples, family and group counseling services are available for currently enrolled students. Services are provided in a confidential, supportive, and culturally sensitive environment. Please contact the IVC Mental Health Counseling Services at 760-355-6310 or in the building 1536 for appointments or more information.



### **Veteran's Center**

The mission of the [IVC Military and Veteran Success Center](#) is to provide a holistic approach to serving military/veteran students on three key areas: 1) Academics, 2) Health and Wellness, and 3) Camaraderie; to serve as a central hub that connects military/veteran students, as well as their families, to campus and community resources. Their goal is to ensure a seamless transition from military to civilian life. The Center is located in Building 600 (Office 624), telephone 760-355-6141.

### **Student Equity Program**

- The Student Equity Program strives to improve Imperial Valley College's success outcomes, particularly for students who have been historically underrepresented and underserved. The college identifies strategies to monitor and address equity issues, making efforts to mitigate any disproportionate impact on student success and achievement. Our institutional data provides insight surrounding student populations who historically, are not fully represented. Student Equity addresses disparities and/or disproportionate impact in student success across disaggregated student equity groups including gender, ethnicity, disability status, financial need, Veterans, foster youth, homelessness, and formerly incarcerated students. The Student Equity Program provides direct supportive services to empower students experiencing insecurities related to food, housing, transportation, textbooks, and shower access. We recognize that students who struggle meeting their basic needs are also at an academic and economic disadvantage, creating barriers to academic success and wellness. We strive to remove barriers that affect IVC students' access to education, degree and certificate completion, successful completion of developmental math and English courses, and the ability to transfer to a university. Contact: 760.355.5736 or 760.355.5733 Building 100.
- The Student Equity Program also houses IVC's Homeless Liaison, who provides direct services, campus, and community referrals to students experiencing homelessness as defined by the McKinney-Vento Act. Contact: 760.355.5736 Building 100.

### **Student Rights and Responsibilities**

Students have the right to experience a positive learning environment and to due process of law. For more information regarding student rights and responsibilities, please refer to the IVC [General Catalog](#).

### **Information Literacy**

Imperial Valley College is dedicated to helping students skillfully discover, evaluate, and use information from all sources. The IVC [Library Department](#) provides numerous [Information Literacy Tutorials](#) to assist students in this endeavor.

<b>Anticipated Class Schedule/Calendar</b>
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**\*\*\*Tentative, subject to change without prior notice\*\*\***

WK	Date	Lecture (Monday)	Laboratory (Wednesday)	Laboratory (Friday)
<b>1</b>	2/12	Ch 7	Safety, Lockers	Holiday
<b>2</b>	2/19	Holiday	MB: Lewis Structures	M-19: Orbital Hybridization
<b>3</b>	2/26	Ch 8	IVC-14: Melting Point	Lecture Exam 1
<b>4</b>	3/5	Ch 8	M-22: Freezing Point	M-21: Heat of Vapor/Fusion
<b>5</b>	3/12	Ch 10	Lab Exam 1	Lecture Exam 2
<b>6</b>	3/19	Ch 11	M-26: Rate of reactions	IVC-21: Kinetics
<b>7</b>	3/26	Ch 12	IVC-21: Kinetics	Lecture Exam 3
	Holiday	Holiday		
<b>8</b>	4/9	Ch 16	M-36: Electrochemical cells	IVC-23: Electrolysis
<b>9</b>	4/16	Ch 16	IVC-23: Electrolysis	IVC-24/M-43: Nuclear Radiation
<b>10</b>	4/23	Ch 17	Lab Exam 2	Lecture Exam 4
<b>11</b>	4/30	Ch 18	IVC-24/M-43: Nuclear Radiation	IVC-25 Complex Ions
<b>12</b>	5/7	Ch 19	IVC-16: Intro to Organic	Lecture Exam 5
<b>13</b>	5/14	Ch 20	IVC-25 Complex Ions	M-20: Gel Slim, Polymers
<b>14</b>	5/21	Ch 21	IVC-15: Organic Chemistry	Locker checkout
<b>15</b>	5/28	Holiday	Lab Exam 3	Lecture Exam 6
<b>16</b>	6/4		<b>FINAL EXAM</b>	