



CHEMISTRY 108 / Fall 2018: SYLLABUS

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Dr. Ron Rusay Office: PS 235, tel. (925) 969-4216; Office Hours: **MW 10:00-11:00, Tuesday, Thursday, Friday** by appointment; daily e-mail replies usually within 24 hours.



E-mail: rrusay@chemconnections.org or rrusay@dvc.edu

Course Homepage: http://chemconnections.org/general/chem108/
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CHEM-108 Introductory Chemistry, Sections 2341 & 2343

This course is an introduction to the experimental science of chemistry. Using mathematical word problems and chemical terms, the student will have an overview of inorganic chemistry. This course is appropriate for those that have no high school chemistry experience.

Units:	4.00
Grade Code:	Student choice
Repeatability:	0

Prerequisites: MATH-090 or MATH 090E or MATH 090SP or one year of high school algebra or equivalent or equivalent

Recommended: Eligibility for ENGL 122 or equivalent

PLEASE CONSIDER CAREFULLY: The teaching style of this course, which is based upon current research that supports many different individual learning styles, aims to improve *scientific literacy* and *understanding*, while preparing you to succeed in subsequent follow-on chemistry courses and ultimately in various STEM related career paths. Chem 108 incorporates many innovations in guided teaching methods & practices, instructional technologies, and pedagogical applications, which depart from, but are built upon traditional textbook-lecture centered undergraduate courses. The organization and approach are likely quite different from other courses that you are experienced in and comfortable with. The material will not be treated linearly as simple page turning in relation to a required course textbook. You will be challenged to develop and use vocabulary, access a variety of information, to appraise its value, and to use it constructively in different contexts, to answer guided questions, to solve practical problems, to understand how you learn, and to build knowledge. You will have various traditional and digital tools & assets available to you that go well beyond a traditional textbook and lecture notes. You will need to decide how to use them effectively, and to develop your own personal learning plan accordingly. Not all knowledge will be provided to you to repeat back accurately for a grade as you are accustomed to in most courses. Your plan will most likely be different than anyone else's. Without a plan that you can use productively and adjust as the course progresses, you will likely not meet your personal objectives. This metacognitive approach to teaching-learning will translate to any of your other courses and more importantly empower you to effectively address any topic in any discipline at anytime in your careers. **Certain student performance standards are uncompromising and unconditional.** *You are expected to attend each class and lab. You are expected to be punctual and arrive on time for each class and lab. You are expected to start promptly at the beginning of each class and lab. You are expected to be prepared before coming to each class and lab by being familiar with what is planned for each class and laboratory, and also be practiced in the vocabulary, skills, and concepts of the previous classes and labs. You are expected to be informed, attentive & polite to each other throughout each class and lab.* If in the event that you are late or cannot attend a class or lab, please advise Dr. R. by e-mail or phone as quickly as possible and arrangements will be made to assist you.

A. Class Meetings: MW 11:10-12:35 PS277

Lab Meetings: Sec. 2341 M 12:45-3:55 PS217; Sec. 2343 W 12:45-3:55 PS217

Attendance is required in both lecture and laboratory. **NOTE:** College policy calls for dropping students from a course if 2 weeks of class or lab are missed.

Classes begin: 8/27; **Holidays:** 9/3, 9/28, 11/12, 11/22-11/23

In-class Exam dates: 10/1, 11/5, 12/12

B. References and Equipment:

1: Principal Resources:

Chem 108 Experiments (\$17.95 DVC Bookstore) (**REQUIRED/MUST HAVE**)

Webassign (REQUIRED/MUST HAVE): The following **Webassign** link and class key must be used to self-enroll on-line in Chem 108 2341-2343 using your name and DVC id number.

<https://www.webassign.net/v4cgi/selfenroll/classkey.html>

The following **Class Key** must be used to enroll:

dvc 5951 9531

Detailed instructions .pdf

Follow the paragraph after using the Class Key: " I do not have an access code 1. Log in to WebAssign. 2. Select purchase access online and click Continue. 3. Select items to purchase, confirm any license agreements, and click Enter payment information. 4. Provide your payment and contact information to PayPal and click Continue. 5. Review your order and click Complete purchase. 6. Close your receipt and start working in WebAssign."

Webassign enrollment provides access to all of the Webassign resources through your account, which includes *An Introduction to Chemistry* e-book with associated questions and broad collection of supporting resources (\$41.00): *Intro To Chem (With/Webassign) Bishop ISBN 0984337903 Copyright 12 Edition 1Binding Kit/Set/Package*

(Hard copies of *An Introduction to Chemistry, Atoms First ISBN978-0-9778105* can be purchased @ \$74.45.)

http://preparatorychemistry.com/Bishop_Payment_text_atoms.htm

One copy is on 3-hour reserve at the DVC Library.

2: *i-clicker* (REQUIRED/MUST HAVE) Either an *i-clicker* app with a Reef account that enables your smart phone, tablet, or wifi connected laptop, **or one of the devices shown above (old or new); purchases can be made on-line or through the DVC bookstore.** (If you set up a Reef account, you will have a 2 week free-trial period, after that point, you will need to purchase a Reef subscription (\$14.99) or obtain an access code through the bookstore.)

3: A personal e-mail account. (REQUIRED/MUST HAVE)

4: Chem 108 Notebook: (REQUIRED/MUST HAVE) 3 ring recommended

5: Lab safety glasses with side shields or goggles. (REQUIRED/MUST HAVE)

6: Access to the Internet (Can be limited, such as only on DVC Campus, but (REQUIRED/MUST HAVE)

C. Course Outline/ Objectives / Topics:

Student Learning Objectives (SLOs), Students will be able to:

Lecture

1. Define introductory chemical terms and give examples of how they are used.
2. Apply the chemical knowledge gained by solving mathematical word problems pertaining to a variety of chemical situations.
3. Distinguish between various states of matter, elements, ions, and molecules by physical and chemical properties.
4. Construct chemical equations, balance them, and calculate product yields utilizing chemical stoichiometry and other

knowledge gained in the course.

5. Calculate solution concentrations, assess the chemical species present in solutions, and evaluate the physical properties of gases, liquids, solids, and solutions

Laboratory

1. Perform a variety of chemical experiments and techniques.
2. Record data and observations.
3. Apply lecture objectives using data to analyze laboratory results.

Content:

Lecture

1. Introduction to experimental science of chemistry
 1. The Scientific Method
 2. Metric system, unit conversions, density and temperature
 3. Significant figures and scientific notation
2. The composition of matter
 1. Physical properties of solids, liquids, and gases
 2. Atoms, molecules, and ionic compounds
 3. Chemical formulas and nomenclature
3. Atomic theory and the Periodic Table
4. Chemical reactions and stoichiometry
 1. Prediction of products and balancing equations
 2. Moles, molar mass, percent composition, chemical yields
 3. Types of chemical reactions
 4. Chemical equilibrium and Le Chatelier's Principle
5. Gas laws
6. Solutions
 1. Solubility rules
 2. Expressions of concentration i.e. molarity and percent composition
7. Acid and base theory
 1. Strong versus weak acids and bases
 2. pH scale
 3. Titrations
 4. Buffers
8. Nuclear chemistry
 1. Radioactivity and radioisotopes
 2. Half-lives and radioactive decay pathways
 3. Uses of radioactivity: medical applications and power generation

Laboratory

1. Observe chemical reactions and write balanced equations
2. Record data and perform calculations with appropriate significant figures
3. Develop laboratory skills such as pipetting, titrations, measuring volume and mass, and qualitative analysis of an unknown
4. Draw conclusions by applying lecture topics and vocabulary

D. Class Preparation & Homework: Staying current: developing, practicing, and applying vocabulary, course content & cognitive skills on a daily basis are essential for your success in this course and in all of your courses of study. The amount of preparation, practice and time required will differ for each of you. In order to score well, the questions to ask yourself while going through this experience are, "Do I know and understand the meaning of the vocabulary? Do I understand the question? Do I understand the concepts? Can I effectively communicate and explain the question, concepts relating to the question, and an approach to solving the problem to someone else? And, can I recognize and correctly answer questions that are similar to the ones contained in the Webassign Homework, the i-clicker response questions, the lab worksheets, the homework problems, the class/lab activities and the Exams' "Practice Questions"?". Correlating the time related to your answer to these questions will provide an estimate of what you will likely need to invest. Exams will be designed to test content & concepts based on these materials. **Suggested order of emphasis is: 1) (Refer to the course [calendar page](#) frequently) *Print & read the on-line Class Powerpoint Slides that are linked from the course calendar & consider possible answers for the i-clicker questions before coming to each class. The slides are the main resource to guide and focus your attention. Take in class notes on the printed slides, record i-clicker answers. Review before the next class; one related question will start each following class.* 2) *Complete and submit all on-line links from the calendar labeled Guided Question.* 3) *Complete all lab assignments; consulting and collaborating with lab mates is encouraged.* 4) *Individually complete the Webassign Homework assignments working on them as frequently as possible and submitting the completed assignments before the scheduled due dates;* 5) *Forming study groups is highly encouraged to test your understanding and to assist you as you deem necessary in developing a level of mastery of the in-class and lab problems and topics. Student tutors are available on a scheduled basis in PS 110.* 5) Referring frequently to the calendar and its linked information is an unconditional course requirement. If this is not done prior to bringing any questions forward to Dr. R., those questions will most very likely NOT be addressed nor answered.**

E. Grading:

i-clicker questions/ in-class participation + answers to on-line Guiding Questions + on-line simulations/quizzes are valued at 15% of the TOTAL grade; Webassign homework is valued at 15% of the TOTAL grade; Laboratory activities & related assignments are valued at 25% of the TOTAL grade; 3 "Cumulative" Exams, each include topics from the beginning of the course, which are each valued at 15% of the TOTAL grade.

Exam dates: 10/1, 11/5, 12/12

Final letter grades will be assigned based on: 87-100 A/A-; 75-86 B/B-; 60-75 C/C-; 50-59 D; <50 F, using a normalized class grading.

NOTE: The DVC Code of Conduct will be strictly enforced. **Cheating and plagiarism are unacceptable and will unconditionally result in a failing grade.** [Cell phones will not be allowed in rooms during exams and quizzes.] SEE: DVC Academic College Policies

F. Attendance & Absences:

On-time attendance at all scheduled class and lab meetings is unconditionally expected. If you arrive late for class or lab, you will be marked absent. Two late arrivals will be excused provided that you advise Dr. R. immediately after class or lab. If you are to miss a class, quiz, exam or lab due to illness or other legitimate reason, you must advise Dr. R. prior to, or on the day that it is scheduled. If you do not do so, there will be no possibility of making up any missed work or of being excused from assignments, activities or the material presented. Notifying Dr. R. can be done by calling: (925) 969-4216 or sending an e-mail to Dr. R. ***If you miss a cumulative total of 8 laboratories and/or lectures regardless of the reasons, you may be dropped from the course.*** [College policy provides for a student being dropped from a course if the student misses a cumulative total of two weeks of class/lab meetings.]

G. Laboratory:

The laboratory component of the course is skill based and absolutely essential to the overall course. ***A failing grade in the lab portion will result in a failing grade for the course.*** The laboratory curriculum will consist of a set of experiments and activities relating to the class topics. The lab grade constitutes 25% of the final grade.

H. Safety:

Laboratory safety is of the utmost importance to your well being and to your lab mates. Chemical exposure must be minimized through good lab practices. All wastes must be properly disposed of, eye protection must be worn at all times. No one can work in the lab without an instructor being present. Only scheduled experiments are allowed. Bare feet, food, drink, eating, and conduct which places anyone at risk are unacceptable. **Violation of safety standards can result in being dropped from the course.**

I. Internet and ChemWiki use and related:

The course will employ the Internet and Information Technologies in a variety of ways. This is NOT a course which teaches the Internet. The course is designed to use the Internet with its wealth of resources as a transparent tool to teach chemistry. Combined with good study practices, it will help you, the student, to better and more easily understand concepts and to make your learning experience broader and more successful.

Students are not required to have a computer or off campus access to a computer. ***(Please see Dr. R. privately and as soon as possible if your only access will be on the DVC campus.)***

Free e-mail accounts are available. **Each student MUST have their own e-mail account for class communication.**

There will be no charges for the use of the Internet, computers or course related software.

Use of the Internet and Information Technologies will need the latest version of a browser for both the Internet as well as for other computer programs. All programs will be free for student use with the exception of Webassign, which must be purchased. But, Webassign includes an electronic version of the textbook. Since not every student has a computer or off-campus access to a computer, computer related assignments are devised and time budgeted so that these assignments can be done while on the DVC campus by accessing the Internet from the Physical Science building's computers or other computers on the DVC campus that are available to DVC students. The digital course materials have been thoroughly vetted but as with any digital resource and technology there may be failures in delivery. **Please advise Dr. R. immediately of any broken links, pages that do not load correctly or problems with site access citing the Web address (URL) of the page or pages.**

Students are expected to visit regularly the course calendar page, which will be updated weekly and set for the current week on **Mondays**. The Homepage is the main tool for communicating information to the class. It includes all information on the course in addition to providing Internet links to many useful Web sites and materials for the course. The Homepage is a living course document. Information will be added as the course proceeds and past information will be archived. **Referring frequently to the calendar and its linked information is an unconditional course requirement. If this is not done prior to bringing any questions forward, those questions will most very likely NOT be addressed nor answered.**

If you do not already have e-mail, consult the Web Resource information linked from the Homepage for information on how to obtain your free e-mail account. Select a provider: Yahoo, Hotmail, G-mail, etc. and follow their on-line instructions.