

CHEMISTRY 104

Lecture 1, Fall 2016

Read This Syllabus Today

Keep It for Future Reference

General Chemistry 104:	5 credit hours
Whole Class Meetings:	9:30-10:45 AM TR 1351 Chemistry
Teacher:	Professor Silvia Cavagnero 5351 Chemistry (262-5430) chem104lec1fall16@chem.wisc.edu
Office Hours:	T, R 4:35-5:35 PM or email for appointment (write the word "appointment" in the header of your email).
Course Coordinator:	Dr. Amy Tatarsky chem104lec1fall16@chem.wisc.edu
Course Email:	chem104lec1fall16@chem.wisc.edu
Website (D2L):	https://learnuw.wisc.edu/
General Chem Website:	http://genchem.chem.wisc.edu/
Undergraduate Office:	Room 1328 Chemistry, 263-2424

Chemistry 104 is the second semester of a first-year course in college chemistry. Students in Chemistry 104 are presumed to have taken Chemistry 103 or its equivalent.

Required Material

Unless you already have it, you will need to purchase each item. These are the only required items for this lecture.

Textbook: *Chemistry: The Molecular Science*, 5th ed. Moore, Stanitski, Jurs, Brooks/Cole 2015. A course schedule with reading assignments from the textbook is available in the D2L course website.

Lab Book: *Chemistry 104 Laboratory Manual, Fall 2016* Chemistry Department, University of Wisconsin-Madison; available in the chemistry building lobby from Alpha Chi Sigma, cash only.

Lab Notebook: Carbonless laboratory notebook with duplicate pages available from Alpha Chi Sigma or local bookstores. (You can continue to use your 103 lab notebook until you run out of pages.)

Safety Goggles: Industrial quality eye protection is required at all times when you are in the lab. Safety goggles that completely seal around the eyes and fit over regular glasses can be purchased from local bookstores.

USB Flash Drive: A USB flash drive that will hold at least 2 GB is required for lab data collection.

Electronic Devices: A cell phone with texting capabilities to answer in-class questions with the TopHat technology. Alternatively, you may use an iPad or a laptop computer connected to the web. Read the next section about how to register for TopHat. If you do not own one of these devices, get in touch with Prof. Cavagnero or your TA as soon as possible.

Calculator: An inexpensive calculator is required. It should have capabilities for square roots, logarithms and exponentiation (antilogarithms), and exponential (scientific) notation operations. The calculator will be used on homework assignments, quizzes, exams, and in the lab. A programmable calculator may be used on exams as long as no information is stored on it, such as chemical formulas or equations. It must be of the type allowable on an ACT or SAT exams (no cell phone or iPod calculators). You must clear the memory before entering the exam room.

Web-Based Course Materials

To access Web-based materials, you must have activated your UW-Madison NetID so you have an ID and password. You probably have already done this. If not, activate your NetID by going to <https://www.mynetid.wisc.edu/activate>, entering your ID number, and following the directions.

Technology Enhanced Learning: Desire to Learn (D2L) Web Site

Much of Chem 104 is only available via **Desire to Learn (D2L)**, a course management system widely used at UW-Madison. You automatically have access to the 104 materials in D2L if you are enrolled in this course. You can use D2L on your own computer, a friend's computer, or any other computer on campus. Many students access it from a smart phone or a tablet computer. Direct your Web browser to <https://learnuw.wisc.edu/>. If necessary, log in by entering your NetID and Password. Look for Chemistry 104, Fall 2016. Click on Chemistry 104, Fall 2016 to see your assignments.

Health or Disability Concerns

All students at UW are entitled to an accessible, accommodating, and supportive teaching and learning environment. The provision of reasonable accommodation for students with disabilities is a shared faculty and student responsibility. Students are expected to inform their professor of their need for accommodation; the professor and TA are expected to make the reasonable arrangements. If you have special needs, please contact the course coordinator (Dr. Tatarsky), who will be in touch with Dr. Cavagnero, and your TA at your earliest convenience. If you have a condition that might result in a seizure, loss of consciousness, or other situation that might endanger your safety or the safety of others in the laboratory, please inform your TA.

Plagiarism and Academic Misconduct

You will be writing laboratory reports and answers to questions on D2L homework in this course. It is not OK to simply copy and paste material from the Web into these reports or answers, nor to copy something written by another student. The UW-Madison Writing Center has a good description of how to paraphrase or quote material that you did not write yourself. It is available at <http://writing.wisc.edu/Handbook/QuotingSources.html>. Also read Appendix 3, "Writing for the Sciences", pp A3-1 to A3-6 in your laboratory manual. This gives good information about how to write up an experiment, including how to cite references. Copying lab results or answers to quizzes, homeworks, or examinations from someone else and passing them off as your own work is academic misconduct and will not be tolerated. Such misconduct is grounds for a failing grade in this course. The UW-Madison statement on academic misconduct is available at <https://www.students.wisc.edu/doso/academic-integrity/>.

IMPORTANT: Required activities that you need to complete before you come to the 1st whole-class meeting on September 6:

Before you come to the 1st whole-class meeting on the September 6th at 9:30 am in room 1351, you need to have completed the following three important activities: TopHat Registration, OWLv2 Registration and the very 1st Pre-Class Activity. In addition, you are also recommended to go through the Course Introduction. By reading and performing the activities listed in the Course Introduction, you will also be able to take the required Lab Safety Quiz and the Academic Honesty Quiz (see next section for due dates). Therefore, this is a worthwhile effort (expect ca 60 min spent on going through the Course Introduction). Finding links to all the above activities is easy: go to the D2L course web page and find all the appropriate links under the "Get Started" section, towards the top of the page.

Lab Safety Quiz and Academic Honesty Quiz.

The Safety Quiz must be passed with a perfect score before you can begin lab work. Therefore you should study the safety information in your laboratory manual and take the Safety Quiz as soon as possible. **You must complete the Safety Quiz before your laboratory session the week of September 12.** You can take the Safety Quiz as many times as necessary to attain a perfect score.

The Academic Honesty Quiz must be completed with a perfect score by 11:55 PM on Monday, September 12. If you read the material in the Lab Manual regarding academic honesty, you should be able to pass this quiz easily.

Midterm and Final Exam Schedule

There will be three midterm exams of 75 minutes each and a two-hour final exam. **No make-up exams will be given.** All exams will include questions based on laboratory as well as pre-class and whole-class activities, homework and discussion.

Exam I	Tuesday,	October 4,	5:45-7:00 PM	Room to be announced
Exam II	Tuesday,	November 1,	5:45-7:00 PM	Room to be announced
Exam III	Tuesday,	December 6,	5:45-7:00 PM	Room to be announced
Final Exam	Saturday,	December 17,	12:25–2:25 PM	Room to be announced

Please send an email to chem104lec1fall16@chem.wisc.edu as soon as possible if you have any conflicts with the above exam times.

Course Organization

This course has been designed and organized to help you learn chemistry, but no course or instructor can learn for you. **Learning is something only you can do. For that reason you are the most important feature of the course.** This means that you will need to devote considerable out-of-class time to studying the subject. The rest of this syllabus outlines the features of the course that will help you learn.

Throughout Chemistry 104 emphasis will be placed on understanding chemistry and learning to think effectively in solving scientific problems. However, **to think effectively and to understand problems, it is necessary to have a basic knowledge of facts and terms: a vocabulary of chemistry.** Most of this background and vocabulary should have been obtained from Chemistry 103 or its equivalent. From time to time, in order to understand the new material in this course, you may need to review material you studied last semester (or whenever you took Chemistry 103 or its equivalent). Chemistry is cumulative; what you learn this semester will build upon background material that you learned earlier. Expect this course to be highly interactive. Here is a layout of the general organization of the course:

Pre-Class Activities. Pre-class activities are meant to be completed before you arrive in class. They will help you understand the whole-class session materials.

Whole-Class Sessions. The purpose of the whole-class meetings (i.e., class time) is to interact as a whole class to engage with key chemistry concepts, clear up misconceptions, tackle challenges, and make connections.

Discussions. The purpose of the Discussions is to practice problem solving, reinforce whole - session concepts, ask questions, make mistakes, and to learn from your peers in a small - group environment.

Homeworks. Homeworks will be assigned to help you reinforce and solidify your understanding of the course material.

Exams. The purpose of the three exams and the final exam is to assess your understanding of the course material.

More Details on Discussion/Laboratory Sessions.

A group of 23 or fewer students constitutes a discussion/laboratory section supervised by one Teaching Assistant (TA). Discussion sections are for questions, help, review, and problem solving relevant to recent whole-class meetings, homework, laboratory experiments and other assigned material. You should be prepared when you come to the discussion class. This means that you should have done the assigned textbook reading, pre-class and whole-class activities and, if possible, attempted some of the homework problems. Ask specific questions of your fellow students and to your TA. Make sure you understand the questions and the answers given by your TA and fellow students. Discussion activities will be highly interactive and you will have plenty of opportunities to practice and improve your understanding of the course material.

In laboratory you will have the opportunity to do chemistry and to apply experimental techniques to solving chemical problems. The lab manual and experiments change each year, so do not purchase an old lab manual.

Student Board.

So that I obtain feedback from students, I would like to set up a Student Board of Directors consisting of one representative chosen from the students assigned to each TA. The board will meet with me on approximately a weekly schedule to discuss course policies and course content. Student Board meetings will be at 3:30 PM on Thursdays and will last no more than 40 minutes. If this time fits your schedule and you are interested in joining the board, send an email message to

cavagnero@chem.wisc.edu to let me know. In your message indicate why you want to be on the board and what qualifications you have for being a member. Also give your discussion section number (a three-digit number between 401 and 416) and the name of your TA (if you know it).

Gen Chem Web Site and Computer Room

Course information is also available on the Gen Chem Web Site for Chemistry 104, Lecture 1. The URL is <http://www.chem.wisc.edu/content/genchem-main> and most of what you need is under “Information for Students” or in the lab section. Often the same information is available on both the Gen Chem and the D2L Web sites, but you need to be familiar with both, because some information may be available on only one of these sites, or one site might be down. Always check both sites before deciding that you cannot find what you want.

All of the software you need for this course as well as access to the Internet and D2L is available in the General Chemistry Computer Room, room 1327 on the first floor of Chemistry. If you have trouble with running software for any of your assignments on your own computer or on a computer at some other location, you can always go to the Gen Chem Computer Room to do the assignment.

Pre-Class Activities.

Online Pre-Class activities will be available via the D2L class web site. Be sure to complete the pre-class activities before each whole-class meeting. Pre-class activities are graded. You can attempt the Pre-Class activity questions and Pre-Class quizzes up to three times each.

In-Class Activities.

During the whole-class meetings on Tue and Thur at 9:30 am, there will be a number of interactive activities that require your active participation and interaction with other students in the classroom. These will be mostly based on multiple-choice questions projected on the screen and on your voting with TopHat. The questions labeled as “Recap” (see icon on the top-right part of the slide) and proposed at the beginning of the whole-class meetings are intended to review the pre-class material. The first two Recap questions shown at the beginning of class are worth 1 pt each if you provide the correct answer. All other TopHat questions are graded for participation (1 point per question), and you will earn points by simply trying your best, regardless of whether your answer is correct. So, get ready to interact with the rest of the class: I count on your participation and I assure you that you will enjoy the experience!

Online Homework.

The Homework is available in OWLv2, that can be accessed via D2L. You can do each Online Homework three times and your highest score will count. Conveniently, when you attempt a question more than once, you do not have to take any of the other questions again. It is to your advantage to start the Online Homework early, because it will provide you with study guidance. Because only your highest score counts, you can use the guidance to direct your study during the week and then score well on the third try near the deadline. The Online Homework is due every Monday at 11:55 PM (except for the last week of classes—see Assignment Schedule). Online Homework questions provide feedback that should help you figure out how to approach similar problems during exams.

Laboratory

The laboratory is extremely important to an understanding and appreciation of chemistry. Examinations will include questions based upon the laboratory material. Each laboratory experiment will have its own criteria for grading and your TA will apply those criteria to evaluating your work. **You must successfully complete all the laboratory assignments, achieving a score of 137 points (62.5%) or more, in order to receive a passing grade in the course.**

In some cases you will need to work with other students in your lab to devise an experimental procedure to solve a problem. We encourage you to discuss your work with your fellow students and TA while doing the experiment. However, your lab write-up must be done as indicated in the lab manual, which often means an individual write-up. A more detailed description of how lab work will be carried out is provided in the lab manual.

ChemPages Laboratory. You will be able to access this interactive, Web based encyclopedia of laboratory techniques using your own computer, or from the general chemistry computer room. ChemPages Laboratory contains multimedia

demonstrations of the laboratory techniques that you will use in Chemistry 104. For almost every laboratory one or two ChemPages sections will be assigned. You should complete these before coming to lab. Your lab manual indicates which ChemPages modules you need for each lab. The URL for ChemPages Laboratory is <http://chem.wisc.edu/deptfiles/genchem/lab/labdocs/index.htm>.

Mid-Semester Survey

There will be a Mid-Semester Survey after the first exam. This survey is designed to collect information about your experience in this course. While the survey is not graded, you are strongly recommended to take it to help improve the quality of the Chem 104 course. The survey is designed so that your responses will be anonymous.

TA Personal Evaluation

This provides a means for your TA to evaluate your overall performance in discussion section and in lab. Your grade will be based on your attendance, preparation, and effective participation in discussion and lab.

How to Get Help

Technical help on TopHat: genchemclickers@chem.wisc.edu

Technical help on OWLv2: chem104hw@chem.wisc.edu

Note: this email address is for technical help on OWLv2 only. You should not use this email if you have conceptual questions on the homework content.

Technical help on D2L: you have two options: either email rachel.bain@wisc.edu or click on the "Technical Help" link on the D2L course homepage. That directs you to a form. Fill in the form and your query will be answered. The form can also be directly accessed at: <https://www.chem.wisc.edu/content/chemcoursehelp>

Help on course content: the wording "course content" includes homework-related concepts, pre-class activities, discussion activities, textbook and whole-class content, or help on lab-related matters: Email your TA or any of the TAs for the Chem 104 Lecture 1 course. Attend one of the TAs office hours. Attend one of Prof. Cavagnero's office hours listed on the 1st page of this syllabus.

Help on course coordination: These matters include special accommodations for disabilities, schedule conflicts, questions on exam locations and times, notifications about sickness, and any issues with laboratory, discussion and exam attendance. Send email using the course email address: chem104lec1fall16@chem.wisc.edu. Important: do not use Prof. Cavagnero's personal email, as only emails sent to chem104lec1fall16@chem.wisc.edu will be answered.

Grades

Your Chem 104 grade will be based on the following partitioning:

Pre-Class Activities <i>(due before each class)</i>	4 %
Whole-Class Activities <i>(to be done while attending class)</i>	4 %
Discussion Activities <i>(to be done during Discussion. Grades will be assigned by the TAs at the end of the semester based on attendance)</i>	5 %
Twelve weekly Online Homeworks (D2L) <i>(due every Mondays at 11:55 PM, except for the last homework of the semester)</i>	10 %
Laboratory: ten experiments <i>(1 formal lab report – graded--; and nine regular lab reports, only some of which will be graded. Each week's experiment is listed in the Course Assignment Schedule)</i>	20 %
Two Special Quizzes <i>(Safety Quiz due before first lab, and Academic Honesty Quiz both due Monday, September 12, 11:55 PM.)</i>	2 x 0.2 %
TA Personal Evaluation	0.6 %
Three 75-min. exams <i>(dates are listed in the Course Assignment Schedule)</i>	3 x 12 %
Final Exam <i>(Saturday, December 17, 12:25-2:25 PM, room to be announced)</i>	20 %
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Total	100 %

Letter Grades.

Your letter grade will be determined based on the number of points you have accumulated, weighted as listed above. The letter grades will be based upon curving all the student scores. After each exam, a curve with approximate letter grade cutoffs based on exam scores will be shown in class, to provide you with feedback about your standing. At the end of the semester, if necessary, laboratory grades will be normalized to a common scale to minimize differences in grading practices among sections. Each item that contributes to your grade has been described earlier in this syllabus.

Chemistry 104, Lecture 1, Fall 2016, S. Cavagnero: Assignment Schedule, p 1

Date	Subject	<i>Pre-Class Activities and Weekly Book-Chapter Readings (Moore 5th ed.)</i>	<i>Computer, Desire2Learn, and Other Assignments</i>	<i>Laboratory</i>
T Sept 6	Rates of Reactions	Pre-Class activity: see D2L Weekly Reading: Ch. 11: Sec. 1.	Desire2Learn (D2L) Online: read the Course Introduction , do the OWLv2 Registration and TopHat Registration in D2L: all must be completed <i>before</i> the 1 st whole-class meeting on Sept 6. Do the Academic Honesty Quiz in D2L, due Mon Sep 12, 11:55 PM. D2L is at: https://learnuw.wisc.edu/	There is no lab this week. To get prepared for next week's lab, read pages v to xlv of Lab Manual. Locate ChemPages Lab Resources online (see p. vii of Lab Manual). Complete the mandatory D2L Online Safety Quiz , due before next week's lab.
R Sept 8	Rate Laws; Rate Constants, Half-Lives	Pre-Class activity: see D2L Weekly Reading: Ch. 11: Sec. 1-3.	Desire2Learn Online Homework 1 due Mon, Sep 12, 11:55 PM	NOTE: You cannot be in lab if you have not completed the Safety Quiz <u>before</u> you go to lab next week.
T Sept 13	More on Rate Laws, Factors that Affect Reaction Rates	Pre-Class activity: see D2L Weekly Reading: Ch. 11: Sec. 3-4.		Check In.; Safety Quiz (to be completed before lab) Neutron Activation of Silver, Expt. 1
R Sept 15	Complex Reactions, Mechanisms	Pre-Class activity: see D2L Weekly Reading: Ch. 11: Sec. 4-6.	Desire2Learn Online Homework 2 due Mon, Sep 19, 11:55 PM	
T Sep 20	More on Complex Reaction Mechanisms, Catalysis, Intermolecular Forces; Liquids	Pre-Class activity: see D2L Weekly Reading: Ch. 11: Sec. 7-8. Review Ch. 7: Sec. 5-6; Ch. 9: Sec. 1-3 and 5.		Crystal Violet, Expt. 2
R Sep 22	Organic Structures Isomers	Pre-Class activity: see D2L Weekly Reading: Ch. 2: Sec. 9; Ch. 6: Sec. 3, 5; App E (pp. A.25-A.29)	Desire2Learn Online Homework 3 due Mon, Sep 26, 11:55 PM. Memorize names of first 10 alkanes in Table E.1 (Appendix E), p. A25	
T Sep 27	Organic Chemistry	Pre-Class activity: see D2L Weekly Reading: Ch. 10: Sec. 1-4	Memorize class names and gen. formulas in Table E.2 (Appendix E), p. A28	Molecular Structures, Expt. 3
R Sep 29	Organic Chemistry; Polymers	Pre-Class activity: see D2L Weekly Reading: Ch. 10: Sec. 5-6	Desire2Learn Online Homework 4 due Mon, Oct 3, 11:55 PM	No lab next week – Exam.

Tuesday, October 4, Exam I (given in the evening from 5:45 to 7:00 pm, room to be announced: this exam covers material through Sep 29; Neutron Activation of Silver, Crystal Violet and Molecular Structures labs). There is no morning (9:30-10:45 am) lecture today.

Chemistry 104, Lecture 1, Fall 2016, S. Cavagnero: Assignment Schedule, p 2

Date	Subject	Pre-Class Activities and Weekly Book-Chapter Readings (Moore 5 th ed.)	Computer, <i>Desire2Learn</i> , and Other Assignments	Laboratory
R Oct 6	Biochemistry: Proteins	Pre-Class activity: see D2L Weekly Reading: Ch. 1: Sec. 14; Ch. 10: Sec. 7; Desire2Learn Tutorials		No lab this week – Exam
T Oct 11	Biochemistry: Proteins	Pre-Class activity: see D2L Desire2Learn Tutorials		Synthesis of Biodiesel, Expt. 4
R Oct 13	Biochemistry: Lipids; Carbohydrates and Polysaccharides	Pre-Class activity: see D2L Weekly Reading: Ch. 10; Sec. 7; Desire2Learn Tutorials	Desire2Learn Online Homework 5 due Mon Oct 17, 11:55 PM	
T Oct 18	Biochemistry: DNA, Importance of Molecular Structure	Pre-Class activity: see D2L Weekly Reading: Ch. 7: Sec.6-7;Desire2Learn Tutorials		Preparation of Tylenol and Some Flavoring Esters, Expt. 5
R Oct 20	Chemical Equilibrium	Pre-Class activity: see D2L Weekly Reading: Ch. 12: Sec. 1-2.	Desire2Learn Online Homework 6 due Mon Oct 24, 11:55 PM Mid-Semester Survey (Desire2Learn) due Wed Oct 26, 11:55 PM	
T Oct 25	Chemical Equilibrium	Pre-Class activity: see D2L Weekly Reading: Ch. 12: Sec. 3-5.		Chemical Equilibrium and LeChatelier's Principle, Expt. 6
R Oct 27	Chemical Equilibrium	Pre-Class activity: see D2L Weekly Reading: Ch. 12: Sec. 6, 8.	Desire2Learn Online Homework 7 due Mon Oct 31, 11:55 PM	Formal Lab Report on Chem. Eq. and LeChatelier lab; your TA will explain how this works. No lab next week—Exam.
<p>Tuesday, November 1, Exam II (given in the evening from 5:45 to 7:00 pm, room to be announced: covers material through Oct 27; Biodiesel, Tylenol/Flavoring Esters and Chem. Equil/LeChatelier labs). There is no morning (9:30-10:45 am) lecture today.</p>				

Chemistry 104, Lecture 1, Fall 2016, S. Cavagnero: Assignment Schedule, p 3

Date	Subject	Pre-Class Activities and Weekly Book-Chapter Readings (Moore 5 th ed.)	Computer, <i>Desire2Learn</i> , and Other Assignments	Laboratory
R Nov 3	Thermochemistry	Pre-Class activity: see D2L Weekly Reading: Review Ch. 4: Sec. 1-10		No lab this week – Exam
T Nov 8	Entropy	Pre-Class activity: see D2L Weekly Reading: Ch. 16: Sec. 1-4		Chemical Equilibrium and Thermodynamics, Expt. 7
R Nov 10	Gibbs Free Energy	Pre-Class activity: see D2L Weekly Reading: Ch. 16: Sec. 5-8	Desire2Learn Online Homework 8 due Mon Nov 14, 11:55 PM	
T Nov 15	Acids and Bases Bronsted Acids and Bases	Pre-Class activity: see D2L Weekly Reading: Ch. 14: Sec. 1-2		Electrochemical Cells—A Discovery Experiment, Expt. 8
R Nov 17	pH; Acid-Base Equilibria; Ionization	Pre-Class activity: see D2L Weekly Reading: Ch. 14: Sec. 3-5	Desire2Learn Online Homework 9 due Mon Nov 21, 11:55 PM	
T Nov 22	Structure and Acid-Base Strength; Lewis Acids and Bases	Pre-Class activity: see D2L Weekly Reading: Ch. 14: Sec. 7-8; Ch. 14: Sec. 6, 9		No lab this week – Thanksgiving week
R Nov 24	Thanksgiving Day: no class		Desire2Learn Online Homework 10 (short) due Mon Nov 28, 11:55 PM	
T Nov 29	Buffers and Titrations	Pre-Class activity: see D2L Weekly Reading: Ch. 15: Sec. 1-2		Acid and Base Solutions, Expt. 9
R Dec 1	More on Buffers and Titrations. If time allows: Electrochemistry Basics: Voltaic Cells	Pre-Class activity: see D2L Weekly Reading: Ch. 17: Sec. 1-2	Desire2Learn Online Homework 11 due Mon Dec 5, 11:55 PM	No Mon-Dec-5 and Tue-Dec-6 labs next week. However, labs on Wed, Thurs, Fri will meet for Expt 10 (details on next page) on Dec 7, 8 and 9 next week.

Tuesday, December 6, Exam III (given in the evening from 5:45 to 7:00 pm, room to be announced: covers material through Dec 1; Chem. Equilib. and Thermo., Electrochemical-Cells Discovery, and Acid-Base Solns labs.). There is no morning (9:30-10:45 am) lecture today.

Chemistry 104, Lecture 1, Fall 2016, S. Cavagnero: Assignment Schedule, p 4

<i>Date</i>	<i>Subject</i>	<i>Pre-Lecture Activities and Weekly Chapter Readings (Moore 5th ed.)</i>	<i>Computer, Desire2Learn, and Other Assignments</i>	<i>Laboratory</i>
R Dec 8	Electrochemistry: Cell Potentials	Pre-Class activity: see D2L Weekly Reading: Ch. 17: Sec. 3-5	Desire2Learn Online Homework 12 due Wed Dec 14, 11:55 PM. Note the unusual due date	Wed Dec 7, Th Dec 8, Fri Dec 9 lab sessions only: Titration and Formula Weight Determination Expt. 10: Check Out
T Dec 13	Electrochemistry: Gibbs Energy and Cell Potentials, Batteries, Fuel Cells, Electrolysis	Pre-Class activity: see D2L Weekly Reading: Ch. 17: Sec. 6-11	Don't forget to turn in Homework 12: due Wed Dec 14, 11:55 PM!	Mon Dec 12 and Tue Dec 13 lab sessions only: Titration and Formula Weight Determination Expt. 10: Check Out
R Dec 15	Electrochemistry wrap-up; Course Review; Course evaluation	Pre-Class activity: see D2L Weekly Reading: Ch 17: Sec. 12	End-of-Semester Survey must be completed by 11:55 PM, Thursday, December 15	No lab on Wed, Th and Fri this week
<p>Saturday, December 17, 2016, FINAL EXAM 12:25 PM – 2:25 PM.; rooms to be announced. (Will cover all course material with about 20% on electrochemistry and Titration and Formula Weight Determination lab.)</p>				