

CHEMISTRY 104

Lecture 3, Spring 2016

Read This Syllabus Today. Keep It for Future Reference.

General Chemistry 104:	5 credit hours
Whole Class Sessions:	1:20 PM MWF 1351 Chemistry
Instructor Information:	Professor Judith N. Burstyn 5327 Chemistry (262-0328) http://www.chem.wisc.edu/~burstyn
Problem-Solving Workshop:	M 6:00 – 7:00 pm, 1371 Chemistry
Office Hours:	MW 2:15 – 3:15 pm, 5327 Chemistry or email for an appointment

Chemistry 104 is the second semester of a first-year college course in chemistry. The goals of this course are: 1) to build your skills in problem solving, analytical reasoning, and laboratory manipulation, and 2) to build your knowledge of the fundamental chemical principles of molecular structure, kinetics, and thermodynamics. In Chem 104 you will apply these principles to condensation-hydrolysis reactions, acid-base reactions, and oxidation-reduction reactions. Applications will include living organisms, for example in drug design, and in the industrial world, in fuel production and utilization.

“How do I know if Chemistry 104 is the right course for me?” If you answer yes to all of the following three questions, Chemistry 104 is the right course for you. 1) Does your potential major or career goal require chemistry beyond General Chemistry, or are you undecided but considering majors/careers that would require more chemistry? 2) Did you complete Chemistry 103 or its equivalent with a grade of C or better? 3) Are you willing to work hard to master the concepts and applications of chemistry in problem solving and in the laboratory?

Course Organization and Expectations

This course is designed to help you to learn chemistry. Your professor and TA will do their best to guide you in mastering the material, 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. Many learning activities are offered in order to meet the needs of different types of students; however, if you find that your learning needs are not being met or you are not satisfied with some aspect of the course please bring your concern to your professor, your TA, or your Student Board of Directors representative.

You will need to devote considerable out-of-class time to studying chemistry. A good rule of thumb is that you should be spending approximately three hours outside of class for each hour you are in class. A recommended study strategy for this course is: 1) read the assigned material in the text before each whole class session, 2) attend class and take your own notes, 3) as soon as possible after class, begin to work the homework problems. When you encounter problems that you cannot solve, follow the guidance in OWL or refer to your notes, a tutorial, or your fellow students. Forming a study group to work through problems together is an excellent way to learn chemistry.

Throughout this course emphasis will be placed on understanding chemistry and learning to think effectively in solving problems. Successful problem solving requires a basic knowledge of principles, facts and terms: a vocabulary of chemistry. Chemistry is a cumulative subject; what you learn this semester will build upon background material that you learned earlier.

To help you to master the new material presented in this course, specific learning objectives are provided for each exam. These objectives are available under the Content and Exam Preparation Materials headings in Learn@UW (see below). Use the learning objectives to guide your work on the homework and to review for the exams. Study questions keyed to the learning objectives are also available in the same location to give you more problem-solving practice. Practice exams, and fully worked out answers, will be available for you to use in preparing for each exam. It is not possible to succeed in Chem 104 without devoting considerable time and effort solving chemistry story problems and mastering problem-solving methods.

Required Texts & Materials

You will need to purchase each item listed below. These are the only required items for this course.

Textbook: *Chemistry: The Molecular Science (5th Ed.)*, by Moore and Stanitski. You may purchase the hardcover edition, a slightly less expensive unbound edition, or an electronic-only text (all available with OWL2—see below). Used copies may also be available, but we have obtained a significantly discounted price for the full bundle. (You may get it for \$103.)

OWL2 Account: for access to on-line homework, bundled with textbook purchase for no additional charge. If you purchased a used textbook or received one from another student, you must purchase your own access to the OWL2 system after registering for the OWL2 course online. Instructions for registering are on the Learn@UW site: use the address: <http://login.cengagebrain.com/course/E-TWQN55T52B7KN>. Use your wisc.edu e-mail address as your primary e-mail and your NetID in the “student ID” field. If you used OWL2 last semester, you will still need to register for the class (ID E-TWQN55T52B7KN) with your existing account.

Lab Manual: *Chemistry 104 Laboratory Manual, Spring 2016*, Chemistry Department, University of Wisconsin-Madison, which is available ONLY from Alpha Chi Sigma. Books will be sold in the chemistry study room (1375 Chemistry) through Jan. 29, and afterwards in the first floor laboratory stockroom (room 1334). Cost is \$20, **payable only by Wiscard**.

Lab Notebook: Carbonless laboratory notebook with duplicate pages: available from Alpha Chi Sigma or local bookstores, where it is more expensive. (You may continue to use your Chem 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 or Alpha Chi Sigma.

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

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. You may use programmable calculators in this course.

i>clicker: Available at local bookstores. **To register your i>clicker with our class, go to the Learn@UW homepage, click on “Register your i>clicker” and follow the instructions. Please bring your i>clicker to every whole class session.**

Web-Based Course Materials and Class Emails

To access Web-based course materials, you must activate your UW-Madison NetID. You probably did this already; if not, activate your NetID by going <https://www.mynetid.wisc.edu/activate> and follow the directions.

Much information about this course will be transmitted via email using an automated email list based on registration in the course. An email was sent to everyone on this list before the first whole class meeting. If you did not receive such an email, you are not registered or you are not reading your @wisc.edu emails. We use your @wisc.edu email for UW-Madison communications. You may forward @wisc.edu email to another account, but you must receive and read it regularly.

Learn@UW Course Web Site

Much of the material for this course is only available via Learn@UW. You automatically have access to the Chem 104 materials via Learn@UW if you are enrolled in this course. You may use Learn@UW on your own computer, a friend’s computer, or any other computer on campus. Direct your Web browser to <https://coursedashboard.learnuw.wisc.edu> and log in with your NetID Username and Password. If you have a problem accessing the Chem 104 Learn@UW page, and you have been registered for this section of Chem 104 for at least two days, send an email to Dr. Rachel Bain at rbain@chem.wisc.edu. Any technical questions about Learn@UW or OWL should also be directed to Dr. Bain.

Safety and Academic Honesty Quizzes

Before your first lab period you must take a Safety Quiz and an Academic Honesty Quiz in Learn@UW and achieve perfect scores. These quizzes are available on the Learn@UW homepage under Getting Started. If you carefully read the safety pages in your lab manual before taking the Safety Quiz, you should have no difficulty in achieving a perfect score.

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 necessary arrangements. If you have special needs, please make an appointment to speak to Prof. B. 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.

The rest of this syllabus and the course schedule are in Learn@UW. Log in and go to the Content menu. Under Course Info click on Syllabus, Schedule, or another heading to download a PDF file. The full syllabus contains information about how your final grade will be calculated, among other important things.

Learning Activities in Chemistry 104

Chemistry 104 has different learning activities to meet the needs of the many types of students in our class. You do not need to attend every class, make use of every tutorial, or do every study problem; rather, your job is to sample the different types of materials offered and to select those activities that most effectively support your learning. In the whole class meetings, the professor will present information, do demonstrations, and lead problem solving. In discussion section, your TA will engage a smaller group of students in problem solving, answer specific questions on the course material, and introduce the laboratory exercises. Finally, in lab you will explore chemical principles through hands on experimentation. To supplement these activities, tutorials are provided to aid your mastery of the material. Attendance at the whole class meetings and the discussion sections is not required; however, students who consistently attend outperform those who do not. Laboratory attendance is mandatory: students who do not attend lab will fail this course.

Whole Class Sessions

In class Prof. B. will provide an organizational framework, discuss principles, and present illustrations and demonstrations. She will not describe or explain everything you should learn; rather, she will indicate what topics you should study and should provide insights into those topics. Clicker questions will give you an opportunity to think actively in class about these topics and see whether you understand them. You should take notes during class: note taking should be an active, thinking process. Your notes should reflect your understanding of what you heard and saw. If there are particular concepts or ideas that are not clear to you feel free to ask Prof. B. or your TA about them after class, by email, or in office hours. Notes taken by a Teaching Assistant (TA) will be posted in Learn@UW shortly after each lecture; don't rely on these notes in place of your own but if you need to miss a class, they are an acceptable substitute. Please do not expect to learn everything you need to know in the classroom; you will learn better by working problems on your own or with a group of peers outside of class.

How to Use Your Textbook Read the assigned sections of the textbook prior to each whole class session. Take the time to carefully review the illustrations, equations and graphs in your textbook. Visualization is an important tool that chemists use to understand the world, especially when thinking about molecular structure. Try to make your reading an active process; keep track of those concepts that are confusing, so you will be able to pay especially close attention as those concepts are covered in class. As soon as possible after class, try to work the sample exercises without looking at the answers (which are at the end of the book in an appendix). When you understand the sample exercises, practice your problem solving skills by working the related study questions for that material. Review the learning/exam objectives that relate to a given topic as you study. At the end of each chapter you will also find a summary of important facts, concepts and operational skills that you should have mastered as you studied that chapter.

OWL Online Problem Sets

Each week you will have an online homework assignment in **OWL**. These assignments are available only in **OWL**. Problem sets test whether you understand the major concepts in each chapter and whether you can apply your understanding to solving problems. Online homework must be completed by 11:55 PM on the due date. To view the online homework, you must be registered for this class in **OWL**. To access the homework, click the **Homework (OWL2)** button. If you have difficulty please email Dr. Rachel Bain at rbain@chem.wisc.edu. Include your name, this course section, and a description of the problem.

Laboratory

Laboratory work is important to an understanding and appreciation of chemistry, and for those of us who love chemistry, lab work is really fun. The laboratory exercises are designed to illustrate the principles described in class, and the exams will include questions based upon the laboratory material. **Note that you must successfully complete all laboratory assignments and achieve an overall lab score of at least a D in order to receive a passing grade in Chem 104.**

During the lab period you will carry out the experiment, take notes, and complete your data analysis. *All your work must be turned in within 24 hours of the end of your lab period, in the format specified in the lab manual or by your TA.* You will be evaluated on your pre-lab preparation, your in-lab experimental technique and data analysis, and on your ability to observe chemical phenomena and record your observations in your notebook. Each laboratory experiment will have its own criteria for grading and your TA will apply those criteria to evaluating your work.

Discussion Section

Discussion sections are lead by your TA for a group of 22 students. The discussion periods are for questions, help, review, and problem solving relevant to recent whole class sessions, homework, laboratory experiments, computer exercises, and other assigned material. Discussion sections will be most helpful if you are prepared when you come to the class. You should have at least tried to work out the homework problems or the objective-keyed study questions from the text. Feel free to bring a printed copy of your homework with you, marked with areas where you need help; your TA cannot solve the specific problems that you have been assigned, but he or she will have a similar example for the class to solve together. Bring specific questions to ask; be sure you understand the questions asked by others and the answers given by your TA and fellow students. Your active participation in discussion will help you and your fellow students learn.

Problem Solving Workshops Every Monday evening (except the week of each exam) there will be a problem-solving workshop, generally lead by Prof. B. TAs may lead problem solving workshops on other evenings, to be selected based on your schedules and theirs. You will participate as a member of a group of students who will collaborate to try to solve a challenging problem based on the *previous week's work*. These challenge problems are very similar to the mastery level problems that you will encounter on the exams. The purpose of these workshops is to give you practice in applying the principles you are learning in solving real-world problems.

Web-Based Tutorial Assignments

The Biomolecules Tutorials are posted on the course Learn@UW site and their due dates are listed in the course schedule. You will complete a set of four web-based tutorials on the structures of biomolecules, each of which is followed by a quiz to demonstrate your understanding. The score on the quiz will be your score for that tutorial.

Exams

There will be three evening exams of 75 minutes each and a 2-hour final exam. Each midterm exam will cover the classroom, assignment, and laboratory material up to that point in the course and since the previous exam. The final exam will be divided approximately equally between material since the third exam and comprehensive coverage of the entire semester.

An early exam will be given before each midterm at 3:30 PM for students who have conflicts with the assigned time. Please note the exam dates on your calendar and avoid scheduling anything at those times. If you have an unavoidable conflict, contact your professor and TA well in advance.

Midterm Exams:	Tuesday, Feb. 16	5:40 – 7:00 PM
	Tuesday, Mar. 15	5:40 – 7:00 PM
	Tuesday, Apr. 19	5:40 – 7:00 PM
Final Exam:	Thursday, May. 10	2:45 – 4:45 PM

The room in which you will take each exam will be announced and posted in Learn@UW. A review session will be held before each exam. ***No make-up exams will be given, but appropriate accommodation will be made for all students to be fairly evaluated.*** If you have any type of special need, options are available to take the exam at an alternate time or place; please contact Prof. B. as soon as possible to make the arrangements.

Learning Objectives, Study Questions and Practice Exams Learning objectives for each exam, and a selected set of study questions from the textbook keyed to the learning objectives, can be found under Exam Preparation Materials in Learn@UW. Practice exams are available in the same location. The study questions are located at the end of each chapter in the textbook, and the answers for many of these questions are given in the back of the book. The same questions will appear in **OWL** as Study Questions for Exam X. These problems are typical of those you should master and you should use them for extra practice in problem solving. In some cases your online homework will suggest that you work on specific study questions to make sure you understand a concept. If you do not understand how to solve one or more study questions, ask your TA in discussion section or your TA or Prof. B. during office hours.

How To Prepare For Exams A recommended strategy is: 1) review the learning objectives for the exam referring the topic outline, your notes or the text as needed, 2) work the study questions associated with each objective, spending more time working problems on those topics you find most challenging, 3) simulate the test taking situation by working the practice exam in 75 minutes in a quiet place, 4) “grade” your own test using the practice exam answer key as your guide, 5) review those areas that you identify as weak.

Important Administrative Information For Chemistry 104

Student Board of Directors

The Student Board of Directors helps Prof. B. to run the course and provides feedback from students on how the course is going. The Board consists of one representative from each discussion/lab section, chosen by the students in that section. The board will meet most weeks at 5:30 PM on Monday to discuss course policies, structure, and content. Meetings will take half an hour. Your TA will solicit volunteers for this role in your first discussion. If you are interested in serving as your class representative, send your TA an email as soon as possible: include your name, your email address, and your section number.

Electronic Mail

You are encouraged to contact Prof. B. by email if you have questions about anything to do with the course. Electronic mail is available at all times of day and night, so you can send messages whenever something comes to mind. Do not expect immediate responses in the middle of the night! My email address is for this class is burstyn@chem.wisc.edu. You will quickly discover that I have another email address. Because I get hundreds of messages every day to that account, I find it easier to communicate with students via a special account. In case of a genuine emergency (illness for an exam, for example) please contact me by phone and at Burstyn@chem.wisc.edu. NOTE: Routine class messages sent to the “Burstyn” email account risk being buried! I guarantee answers to emails within 24 hours if you send them to the class account.

What To Do If You Are Sick, Or Otherwise Unable To Attend An Exam or Lab

If you are unable to attend a specific lab session because of an unavoidable schedule conflict, for example a religious observance, an athletic activity, or a family obligation, contact your TA as soon as possible to reschedule. Make up lab times are only during the week when the entire class is doing a lab exercise, so planning ahead is important. If you find that you are unable to attend lab because you are ill, contact your TA as soon as possible. He or she will discuss your situation and decide what to do. **If unexpected circumstances preclude you taking an exam, please contact your TA or professor before the scheduled exam time.** We recognize that in an emergency situation, you may not be able to contact us in a timely way.

Chemistry Resource Facilities: Computer Room, Study Room, General Chemistry Office

Computers are available for use in room 1375 Chemistry. Room 1371 is a study room for chemistry students. The staff in the Undergraduate Chemistry Office, room 1328, can assist you with enrollment, advising, and many other things.

Cell Phone and Computer Policy

Please turn your cell phone and computer off for the duration of the class or lab period. In a situation where you must be able to answer your cell phone, please set it to vibrate and sit where you will not disturb others when leaving the room.

Grades

Your grade will be based on a maximum of 1000 points divided as follows:

OWL Problem Sets (best 9 out of 10 × 20 points)	180 points
Ten Laboratory Exercises*	240 points
Biomolecules Tutorials and Quizzes (4 × 5 points)	20 points
Safety & Academic Honesty Quizzes (2 × 5 points)	10 points
Three midterm exams @ 100 points each	300 points
Final Exam	250 points
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Total**	1000 points

*Eight of the lab exercises will be worth 20 points. Two lab exercises will require formal lab reports and will be worth 40 points. If necessary, some grades may be normalized upward to a common scale at the end of the semester to minimize differences in grading practices among lab sections.

**We will be piloting a Learning Analytics tool called Pattern this semester. Pattern is an app in which you can track your study habits whose purpose is to help you to improve your learning outcomes. If you consistently log your studying for Chem 104 and complete a survey at the end of the semester, you will earn 10 extra credit points.

Letter Grades.

Final grades will be based upon the absolute scale shown below. If you score the number of points indicated, then you will receive the letter grade indicated, regardless of how many other students achieve the same grade. There is no curve; therefore it is to your benefit (and to your friends' benefit) that you help other students learn and they help you learn. After each midterm exam you will be able to determine your probable grade by totaling your earned points, dividing by the total points possible at that time, multiplying by 1000, and comparing with this list. If necessary, adjustments will be made at the end of the semester, but these adjustments will never lower your final letter grade, only raise it.

A	900 - 1000 points	(90%)
AB	870 - 899 points	(87%)
B	830 - 869 points	(83%)
BC	780 - 829 points	(78%)
C	680 - 779 points	(68%)
D	550 - 679 points	(55%)
F	<550 points	(<55%)

Unit I Schedule: Chemistry 104-3, Spring 2016, Prof. Judith Burstyn

Date	Subject	Reading*	Assignments and Quizzes	Laboratory
W Jan 20	Review of Bonding and Molecular & Structure	Review Ch. 6 & 7	Memorize names of first 10 alkanes , Table E.1, Appendix E, p A.25 Academic Honesty & Safety Quizzes in Learn@UW completed with a perfect score by Sun. Jan. 24, 11:55 pm	No lab this week.
F Jan 22	Organic Structures: Hydrocarbons & Fuel	Ch. 2: Sec. 7 & 9 Ch. 6: Sec. 3, 5, 11 Ch. 7: Sec. 6a-c Ch. 9: Sec. 1-4 Ch. 10: Sec. 1-3		
M Jan 25	Organic Chemistry: Naming & Isomers	Appendix E	Memorize class names, general formulas , Table E.2, Appendix E, p. A28 Homework 1 due Sun. Jan. 31, 11:55 PM	Check In Molecular Structures
W Jan 27	Organic Chemistry: Functional groups	Ch. 10: Sec. 4-5		
F Jan 29	Organic Chemistry: Functional groups	Ch. 10: Sec. 4-5		
M Feb 1	Organic Chemistry: Polymers	Ch. 7: Sec. 2e Ch. 10: Sec 6	Biomolecules Tutorials: Proteins 1 & Proteins 2 (including debriefing) Proteins 1 & 2 quiz in Learn@UW due Sun. Feb. 7, 11:55 PM Homework 2 due Sun. Feb. 7, 11:55 PM	Preparation of Tylenol and Some Flavoring Esters
W Feb 3	Organic Chemistry: Polymers	Ch. 7: Sec. 2f Ch. 10: Sec. 6		
F Feb 5	Biochemistry: Proteins	Ch. Ch. 10: Sec. 7d-e		
M Feb 8	Biochemistry: Lipids & Carbohydrates	Ch. 10: Sec. 5c-e Ch. 7: Sec. 6d Ch. 10: Sec. 7a-c	Biomolecules Tutorials: Lipids & Carbohydrates (including debriefing) Lipids & carbohydrates quiz in Learn@UW due Tues. Feb 9, 11:55 PM Biomolecules Tutorials: DNA 1 & DNA 2 (including debriefing) DNA 1 & 2 quiz in Learn@UW due Thurs. Feb. 11, 11:55 PM Homework 3 due Sun. Feb. 14, 11:55 PM	Synthesis of Biodiesel
W Feb 10	Biochemistry: Nucleic Acids, DNA & RNA	Ch. 7: Sec. 7		
F Feb 12	Catch up & Review of Problem Solving Strategies for Organic & Biological Chemistry	Review Ch. 6, 7, 10		
M Feb 15	Review for Exam I	Prepare for Exam I	No homework – Prepare for Exam I	No lab this week.

Tues. Feb. 16 Exam I 5:40-7:00 pm Chemistry 1351, Chamberlain 2241, Chamberlin Hall 2103: Individual section assignments will be provided.

*Readings are from the specified chapter in the textbook unless otherwise noted. Other material is posted in Learn@UW.

Unit II Schedule: Chemistry 104-3, Spring 2016, Prof. Judith Burstyn

<i>Date</i>	<i>Subject</i>	<i>Reading*</i>	<i>Assignments and Quizzes</i>	<i>Laboratory</i>
W Feb 17	Kinetics: Reaction Rates and Rate Laws	Ch. 11: Sec. 1-3	No homework	No lab this week.
F Feb 19	Kinetics: Reaction Rates and Rate Laws	Ch. 11: Sec. 1-3		
M Feb 22	Radioactivity and Rates of Radioactive Decay	Ch. 18: Sec 1-5 (optional to read end of chapter)	Homework 4 due Sun. Feb. 28, 11:55 PM	Neutron Activation of Silver
W Feb 24	Kinetics: Concentration & Temperature	Ch. 11: Sec. 4-5		
F Feb 26	Kinetics: Reaction Mechanisms	Ch. 11: Sec. 6-7		
M Feb 29	Kinetics: Catalysis	Ch. 11: Sec. 8-10	Biomolecules Tutorial: Enzymes (including debriefing) Enzymes quiz in Learn@UW due Sun. Mar. 6, 11:55 PM Homework 5 due Sun. Mar. 6 11:55 PM	Crystal Violet
W Mar 2	Chemical Equilibrium	Ch. 12: Sec. 1-3		
F Mar 4	Chemical Equilibrium	Ch. 12: Sec. 4-5		
M Mar 7	Chemical Equilibrium	Ch. 12: Sec. 6-7	Homework 6 due Sun. Mar 13, 11:55 PM	Chemical Equilibrium and LeChatelier's Principle
W Mar 9	Chemical Equilibrium	Ch. 12: Sec. 8		
F Mar 11	Catch up & Review of Problem Solving Strategies for Kinetics & Equilibrium	Review Ch. 11, 12, 18		
M Mar 14	Review for Exam II	Prepare for Exam II	No homework – Prepare for Exam II	No lab this week.
Tues. Mar. 15 Exam II 5:40-7:00 pm Chemistry 1351, Chamberlain 2241, Chamberlin Hall 2103: Individual section assignments same as for Exam 1.				

*Readings are from the specified chapter in the textbook unless otherwise noted. Other material is posted in Learn@UW.

Unit III Schedule: Chemistry 104-3, Spring 2016, Prof. Judith Burstyn

<i>Date</i>	<i>Subject</i>	<i>Reading (text)</i>	<i>Assignments and Quizzes</i>	<i>Laboratory</i>
W Mar 16	Thermodynamics: Entropy	Review Ch. 4 Ch. 16: Sec. 1-5	No homework	No lab this week
F Mar 18	Thermodynamics: Entropy	Review Ch. 5 Ch. 16: Sec. 1-5		
Spring Break, Mar 19-Mar 27; No classes				
M Mar 28	Thermodynamics: Reaction Spontaneity & Gibbs Free Energy	Ch. 16: Sec. 6-7	Homework 7 due Sunday Apr 3, 11:55 PM	Chemical Equilibrium and Thermodynamics
W Mar 30	Thermodynamics: Reaction Spontaneity & Gibbs Free Energy	Ch. 16: Sec. 8-11		
F Apr 1	Thermodynamics: Reaction Spontaneity & Gibbs Free Energy	Ch. 16: Sec. 8-11		
M Apr 4	Acids & Bases	Ch. 14: Sec. 1-6	Homework 8 due Sunday Apr 10, 11:55 PM	Acid and Base Solutions
W Apr 6	Acid/Base Equilibria: Strong and Weak Acids & Bases	Ch. 14: Sec. 7-8		
F Apr 8	Acid/Base Equilibria: Strong and Weak Acids & Bases	Ch. 14: Sec. 9-10		
M Apr 11	Acids and Bases: Buffers and Titrations	Ch. 15: Sec. 1-3	Homework 9 due Monday Apr 17, 11:55 PM	Redox Titration
W Apr 13	Acids and Bases: Buffers and Titrations	Ch. 15: Sec. 1-3		
F Apr 15	Catch up & Review of Problem Solving Strategies for Thermodynamics & Acid/Base Equilibria	Ch. 16, 14 & 15: Sec. 1-3		
M Apr 18	Review for Exam III		No homework	No lab this week

Tues. Apr. 19 Exam III 5:40-7:00 pm Chemistry 1351, Chamberlain 2241, Chamberlin Hall 2103: Individual section assignments same as for Exam 1.

Unit IV Schedule: Chemistry 104-3, Spring 2016, Prof. Judith Burstyn

<i>Date</i>	<i>Subject</i>	<i>Reading (text)</i>	<i>Assignments and Quizzes</i>	<i>Laboratory</i>
W Apr 20	Electrochemistry: Redox Reactions & Electrochemical Cells	Ch. 17: Sec. 1-4	No homework	No lab this week
F Apr 22	Electrochemistry: Redox Reactions & Electrochemical Cells	Ch. 17: Sec. 1-4		
M Apr 25	Electrochemistry: Redox Reactions & Electrochemical Cells	Ch. 17: Sec. 1-4	Homework 10 due Sunday May 1, 11:55 PM	Electrochemical Cells / Check Out
W Apr 27	Electrochemistry: Cell Potential and Gibbs Free Energy	Ch. 17: Sec. 5-7		
F Apr 29	Electrochemistry: Cell Potential and Gibbs Free Energy	Ch. 17: Sec. 5-7		
M May 2	Electrochemistry: Applications	Ch. 17: Sec. 8-12	No Homework	No lab
W May 4	Electrochemistry: Applications	Ch 17: Sec. 8-12		
F May 6	Review for Final Exam	Ch. 17; entire course		
Wed. May 11 FINAL EXAM 5:05-7:05 pm Location to be determined				