

KEEP THIS SYLLABUS FOR FUTURE REFERENCE

CHEMISTRY 104

Lecture 2, Spring 2016

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| General Chemistry: | 5 credit hours |
| Lecture Section 2: | 11:00 a.m. MWF, 1351 Chemistry |
| Lecturer: | Professor Kyoung-Shin Choi |
| Room and Phone Number: | 3223 Chemistry, 262-5859 |
| E-mail: | chem104_choi@chem.wisc.edu (Emails sent only to this address will be answered.) |
| Office Hour: | 4:00-4:30 p.m. Tuesday and Friday |
| Learn@UW: | http://learnuw.wisc.edu/ |

Chemistry 104 is the second semester course in the two-semester sequence. Chemistry 103 and 104, providing a general survey of chemical principles and facts, are prerequisites for advanced courses such as Organic Chemistry (341 or 343) and Analytical Chemistry (327 or 329).

The prerequisite for Chemistry 104 is Chemistry 103 and it is assumed that you took this course last semester. If your situation is different you may need to put in extra effort, at the beginning of the semester, to gain the necessary background.

REQUIRED MATERIALS

Textbook: Chemistry: the Molecular Science, by Moore and Stanitski, 5th edition; available at local bookstores. Although used copies may also be available, we have obtained a significantly discount price for the full bundle. You may purchase either the hardcover edition, a slightly less expensive unbound edition, or an electronic-only text (available with OWLv2 account—see OWLv2 below). You may already have a copy from 103.

Chemistry 104 Laboratory Manual, Spring 2016 and carbonless laboratory notebook: The manual and notebook can be purchased (Wiscard only) in room 1375 (the undergraduate computer lab) during the first two week of classes and later from the first floor laboratory stockroom (room 1334).

Safety Goggles: Industrial quality eye protection is required at all times when you are in the lab. Safety goggles that fit over regular glasses can be purchased at local bookstores or along with the lab manual and notebook. Contact lenses should not be worn in the laboratory because fumes or splashes may be caught between them and your eye. Safety rules are posted on your laboratory door.

An electronic RF “clicker”: The lectures will make use of student “voting” on concept tests, surveys, and other questions. Some questions will be graded and used to give extra credits (1 point x 10-20 questions = 10-20 points). You will need to buy a radio-frequency clicker, specifically an i>clicker (or i>clicker2 or i>Clicker+) and bring it to every lecture. A link for clicker registration can be found on the course homepage on Learn@UW (Get Started/i>Clicker Registration). **For technical questions (registration, clicker malfunction), contact: genchemclickers@chem.wisc.edu.**

Calculator: An inexpensive calculator having capabilities for square roots, logarithms and exponentiation (antilogarithms), and exponential (scientific) notation operations is required. The calculator will be used on homework assignments, exams, and in the lab.

An OWLv2 account for access to on-line problem sets: This is bundled with your new textbook for no additional charge. Instructions for registering are given on the course homepage on Learn@UW (Get Started/OWLv2 Registration). If you used OWLv2 in Chemistry 103, you do not need to create a new account. Clicking on the link provided at Learn@UW will automatically register you in the course. If you purchased a used textbook or received one from another student, **you must** purchase your own access to the OWLv2 system after registering for the OWLv2 course online. The payment information can also be found on the course homepage on Learn@UW (Get Started/OWLv2 Registration). **For technical questions (software bugs, system malfunction), contact: chem104hw@chem.wisc.edu.**

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

LECTURE AND DISCUSSION

Lecture. Lectures organize the material, outline goals, cover the basic principles of each topic and present illustrations and demonstrations. The lecture is not intended to describe or explain everything you will learn in the course; rather, it will indicate important topics to study and will give you an opportunity to think about these topics and see if you understand them. My lecture notes will be posted online at the course homepage by midnight on Sunday for the following week. You can print out the notes and bring them to class to take additional notes during lecture.

Demonstrations. The UW-Madison Chemistry Department has a longstanding tradition of using lecture demonstrations to help students understand chemistry. When a demonstration is done in class, observe what happens and make certain that you understand the principles the demonstration is designed to illustrate. If you do not, ask questions, either in lecture or in your discussion section. All demonstrations are important and questions about demonstrations may appear on exams.

Discussion Section. A group of about 22 students constitutes a discussion and laboratory section supervised by a teaching assistant. Discussion sections are for discussion, review, and problem solving relevant to recent lectures, and preparation and review of laboratory experiments. Be prepared when you come to the discussion class. You should work out the homework problems for a given week, and you should expect to be called upon by your TA to discuss solutions to these problems. Ask specific questions of your TA and of other students. Make sure you understand the questions asked and the answers given. If you don't understand, then ask for a further explanation. Do not expect your TA to lecture, but rather to lead discussion and encourage interaction among all students present.

OWLv2 Online Problem Sets. Each week you will have an online homework assignment in OWLv2. These assignments are available only in OWLv2. 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. In order for you to view the online homework, you must be registered for OWLv2. Instructions for registration are given on the course homepage on Learn@UW (Get Started/ OWLv2 Registration). A link to access OWLv2 problem sets is also provided on the course homepage on Learn@UW (Learn & Practice). **All technical questions regarding the OWLv2 homework should be sent to chem104hw@chem.wisc.edu.**

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. 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.

Safety in the Laboratory and Safety Quiz. Read the ‘For Your Safety’ section in the lab manual before you come to lab. It describes safety information specific to that experiment. Safety goggles are required for every experiment. No contact lenses! No sandals! Wear reasonable clothing! Failure to wear proper protective gear in the laboratory is grounds for dismissal from lab, with no provision to make up the work you miss. In Learn@UW page, under “Get Started”, make sure to take the Lab Safety Quiz. This Quiz must be completed by Jan 24 (Sun), 11:55 pm.

Attendance. Unless you are formally excused, you must attend all laboratory sessions. There are no procedures to make-up laboratories you miss and a grade of zero will be recorded for unexcused absences. If you have an excuse for missing lab notify your TA, as soon as possible, before the lab period.

Reports. Lab reports are due by the end of the lab session unless notified otherwise by our TA. Points will be deducted if reports are turned in late. (Your TA will explain the rule.)

RESOURCES

Chemistry 104 Lecture 2 Learn@UW Homepage. Resource material for this lecture section is available at Learn@UW. The homepage for my lecture section includes: course syllabus, overheads used for each lecture and copies of handouts. Consult the website for instructions and tips to help you use Learn@UW at learnuw.wisc.edu

TA Office Hours: TAs for this course will have office hours. You can find their schedules in Learn@UW page and ask them any questions related to the lecture/homework/lab.

Chemistry Resource Facilities: Computers are available for use in room 1375 Chemistry. Room 1371 is a study room for chemistry students.

Undergraduate Chemistry Office: The staff in the Undergraduate Chemistry Office, room 1328 (Tel: 263-2424), can assist you with enrollment, advising, and many other things. You can also use the following webpage for any enrollment questions: <http://chem.wisc.edu/content/enrollment-inquiries>.

Study Groups. You are strongly encouraged to collaborate with other students on homework assignments and laboratory discussion questions. For many students, study groups are very helpful. Unless informed to the contrary, you must turn in your own write-up (not a copy of the study group's work) for all of

your assignments.

Students with Disabilities. Students with disabilities should contact Professor Choi as soon as possible at the beginning of the semester to arrange accommodations. This applies to lecture, discussion, and laboratory, and to special accommodations for exams.

Study Skills. Help with self-assessment, test anxiety, problem solving, time scheduling, note taking, exam preparation/taking, reading efficiency, memory, concentration, and procrastination is available through a one-credit course titled Educational Effectiveness in the School of Education, Department of Counseling Psychology. Interested students should contact the department at 262-0461 to speak with an instructor. Individual counseling is also available at University Counseling and Consultation Services. For more information, call 262-1744 or stop by 115 N. Orchard Street.

GRADES

Exams. There will be three in-class exams and a two-hour final exam. No make-up exams will be given. The final exam will cover topics from the entire semester, but it will be weighted more heavily toward material covered in the last segment of the course. The location of each exam will be announced later. The exam schedule is:

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|------------|------------------------|------------------|
| Exam I | Wednesday, February 17 | 11:00 - 11:50 AM |
| Exam II | Wednesday, March 16 | 11:00 - 11:50 AM |
| Exam III | Friday, April 22 | 11:00 - 11:50 AM |
| Final Exam | Friday, May 13 | 2:45 - 4:45 PM |

Grades. Your grade will be based on a maximum of 980 points divided as follows:

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|--|-------------------|
| Exams I, II, and III (100 pts. Each) | 300 points |
| OWL Problem Sets (best 9 out of 10 x 20 points) | 180 points |
| Safety and Academic Honesty Quiz (2 x 5 points) | 10 points |
| Laboratory (8 standard labs x 20 points)* | 160 points |
| (2 formal lab reports x 40 points)* | 80 points |
| Final Exam | 250 points |
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| Total: | 980 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.

Extra Credits. Some I-clicker questions, which will be announced during lectures, will be graded and used to give extra credits (**1 point x 10-20 questions = 10-20 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. You are competing against this scale, not against other

students, and it is to your benefit to help each other.

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|----|------------------|--------|
| A | 880 - 980 points | (90%) |
| AB | 850 - 879 points | (87%) |
| B | 810 - 849 points | (83%) |
| BC | 760 - 809 points | (78%) |
| C | 670 - 759 points | (68%) |
| D | 540 - 669 points | (55%) |
| F | <540 | (<55%) |

This scale may be adjusted downward. It will never be adjusted upward.

Review Your Grades. Hour exam grades will be entered electronically in Learn@UW so you can check your records for accuracy. Midway through the semester total points so far in problem sets and lab will be entered. The complete grade totals will be entered at the end of the semester. To maintain confidentiality, you will be required to enter your ID number.

Academic Honesty and Academic Honesty Quiz. You will be writing lab reports and answering problem sets in this course. It is not OK to copy and paste others' work or material from the Web into these reports or answers. The UW-Madison Writing Center has a good description of how to paraphrase or quote material that you did not write yourself, available at <http://writing.wisc.edu/Handbook/QuotingSources.html>. University of Wisconsin System (UWS) code 14.03 details academic misconduct subject to disciplinary action. These actions are:

- (a): Seeking to claim credit for the work or efforts of another without authorization or citation
- (b): Using unauthorized materials or fabricated data in an academic exercise
- (c): Forging or falsifying academic documents or records
- (d): Intentionally impeding or damaging the academic work of others
- (e): Engaging in conduct aimed at making false representation of a student's academic performance
- (f): Assisting other students in any act that constitutes academic misconduct

Copying results or answers to questions, homework, or exams from someone else and passing them off as your own work and using someone else's clicker are examples of academic misconduct. **Such misconduct is grounds for a failing grade in this course. Also, your academic misconduct will be notified to the Dean of your school as well as the Dean of Students Office. During the first week of class, make sure to take the Academic Honesty Quiz, found on Learn@UW under "Get Started". This Quiz must be completed by Jan 24 (Sun), 11:55 pm.**

Classroom Etiquette

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.

Noises. Any noise you make during the class can affect the classroom environment. Be considerate to your classmates and minimize any noise that can be destructive for creating pleasant learning environment.

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 and excusable schedule conflict, for example a religious observance, 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. (There is no guarantee that you will be able to reschedule a lab). If you find that you are unable to attend lab because you are ill, contact your TA before the lab session you will miss. He or she will discuss your situation with Prof. Choi and decide what to do. If unavoidable circumstances preclude you taking an exam, please contact your professor as soon as possible before the scheduled exam time.

Schedule for Chemistry 104, Lecture 2, Spring 2016, Prof. Choi

Dates for lecture topics are **approximate**. The exam dates are **fixed**. Click on the **date** for the lecture notes. Click on the **subject** for the lecture slides.

| Week | Date (Notes) | Subject (Slides) | Assignments and Quizzes | Laboratory |
|------|-----------------|--|--|--------------------------------------|
| 1 | W Jan 20 | Organic Chemistry: Hydrocarbons (Chapters: 2.9, 6.3,6.5, 6.11) | Memorize names of first 10 alkanes, Table 2.8 | No lab |
| | F Jan 22 | Organic Chemistry: Hydrocarbons (Chapters: 2.9, 6.3, 6.5, 6.11, 7.6) | Academic Honesty & Safety Quizzes in Learn@UW completed with a perfect score by Sun. Jan. 24, 11:55 pm | |
| 2 | M Jan 25 | Organic Chemistry: Hydrocarbons (Chapters: 2.9, 6.3, 6.5, 6.11, 7.6) | Homework 1 due Jan. 31, 11:55 PM | Check In Molecular Structures |
| | W Jan 27 | Organic Chemistry: Functional Groups (Chapter: 7.6, 10.4, 10.5) | | |
| | F Jan 29 | Organic Chemistry: Functional Groups, Polymers (Chapter: 10.4,10.5, 10.6) | | |
| 3 | M Feb 1 | Organic Chemistry: Polymers (Chapter: 10.6) | Homework 2 due Sunday Feb 7, 11:55 PM | Tylenol Synthesis (Formal report) |
| | W Feb 3 | Chapter 11: Chemical Kinetics | | |
| | F Feb 5 | Chapter 11: Chemical Kinetics | | |
| 4 | M Feb 8 | Chapter 11: Chemical Kinetics | Homework 3 due Sun. Feb. 14, 11:55 PM | Biodiesel Synthesis |
| | W Feb 10 | Chapter 11: Chemical Kinetics | | |
| | F Feb 12 | Chapter 11: Chemical Kinetics | | |
| 5 | M Feb 15 | Review for Exam 1 | No homework | No lab |
| | W Feb 17 | Exam 1 (Locations to be determined.) | | |
| | F Feb 19 | Chapter 11: Chemical Kinetics | | |
| 6 | M Feb 22 | Chapter 12: Chemical Equilibrium | Homework 4 due Sun. Feb. 28, 11:55 PM | Crystal Violet |
| | W Feb 24 | Chapter 12: Chemical Equilibrium | | |
| | F Feb 26 | Chapter 12: Chemical Equilibrium | | |
| 7 | M Feb 29 | Chapter 12: Chemical Equilibrium | Homework 5 due Sun. Mar. 6, 11:55 PM | LeChatelier's Principle |

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| | W Mar 2 | Chapter 12: Chemical Equilibrium Chapter 14: Acids and Bases | | (Formal report) |
| | F Mar 4 | Chapter 14: Acids and Bases | | |
| 8 | M Mar 7 | Chapter 14: Acids and Bases | Homework 6 due Sun. Mar. 13, 11:55 PM | No lab |
| | W Mar 9 | Chapter 14: Acids and Bases | | |
| | F Mar 11 | Chapter 15: Additional aqueous equilibria | | |
| 9 | M Mar 14 | Review for Exam 2 | No homework | No lab |
| | W Mar 16 | Exam 2 (Locations to be determined.) | | |
| | F Mar 18 | Chapter 15: Additional aqueous equilibria | | |
| 10 | Spring Break, Mar 21-Mar 25: No Classes and lab | | | |
| 11 | M Mar 28 | Chapter 15: Additional aqueous equilibria | Homework 7 due Sun. Apr. 3, 11:55 PM | Acids and Bases |
| | W Mar 30 | Chapter 16: Thermodynamics II | | |
| | F Apr 1 | Chapter 16: Thermodynamics II | | |
| 12 | M Apr 4 | Chapter 16: Thermodynamics II | Homework 8 due Sun. Apr. 10, 11:55 PM | Chemical Equilibrium and Thermodynamics |
| | W Apr 6 | Chapter 16: Thermodynamics II | | |
| | F Apr 8 | Chapter 16: Thermodynamics II | | |
| 13 | M Apr 11 | Chapter 17: Electrochemistry | Homework 9 due Sun. Apr. 17, 11:55 PM | Redox Titrations |
| | W Apr 13 | Chapter 17: Electrochemistry | | |
| | F Apr 15 | Chapter 17: Electrochemistry | | |
| 14 | M Apr 18 | Chapter 17: Electrochemistry | No homework | No lab |
| | W Apr 20 | Review for Exam 3 | | |
| | F Apr 22 | Exam 3 (Locations to be determined.) | | |
| 15 | M Apr 25 | Chapter 17: Electrochemistry | Homework 10 due Sun. May 1, 11:55 PM | Electrochemical Cells |
| | W Apr 27 | Chapter 17: Electrochemistry | | |
| | F Apr 29 | Chapter 17: Electrochemistry Biochemistry: Lipids & Carbohydrates | | |
| 16 | M May 2 | Biochemistry: Lipids & Carbohydrates | No homework | Neutron Activation of Silver & Lab Check-Out |
| | W May 4 | Biochemistry: Lipids & Carbohydrates | | |
| | F May 6 | Review for Final Exam | | |
| Friday, May 13 Final Exam 2:45-4:45 pm Locations to be determined. | | | | |