

General Chemistry II (CHEM 102)

Winter Term, 2015

Course components:

1) lecture; 2) online homework (MasteringChemistry); 3) recitation; and 4) laboratory.

Objectives:

At the end of the course, students should be able to:

- understand the concept of the atomic and molecular nature of matter;
- learn the basis of the structure and the physical properties of solids, liquids, and gases;
- understand the factors affecting the chemical reactivity of solids, liquids, and gases;
- solve quantitative problems with stoichiometry, chemical equilibria, and rates of chemical reactions;
- use chemical terminology and units of measures correctly;
- run elementary chemistry experiments and interpret experimental data using appropriate software tools.

Lecturers:

- Dr. **Monica Ilies**; Chemistry Department; Office: Disqué 224 [course coordinator]
 - Lecture B: Mon, Wed, Fri; 12:00-12:50 PM; Disqué 103
- Dr. **Anthony Addison**; Chemistry Department; Office: Disqué 418
 - Lecture E (honors): Mon, Wed, Fri; 2:00-2:50 PM; Disqué 103
- Dr. **Lee Hoffman**; Chemistry Department; Office: Disqué 403
 - Lecture D: Mon, Wed, Fri; 1:00-1:50 PM; Disqué 103
 - Lecture F: Mon, Wed, Fri; 4:00-4:50 PM; Disqué 103
- Dr. **Daniel King**; Chemistry Department; Office: Disqué 509
 - Lecture A: Mon, Wed, Fri; 9:00-9:50 AM; Disqué 103
- Dr. **Molly O'Connor**; Chemistry Department; Office: Stratton 410
 - Lecture C: Mon, Wed, Fri; 11:00-11:50 AM; Disqué 103

First e-mail contact for general course inquiries:

Dr. Monica Ilies: mi73@drexel.edu

First e-mail contact for MasteringChemistry inquiries:

Dr. Paul Deroo: pwd26@drexel.edu

First e-mail contact for laboratory and recitation inquiries:

Please see the contact information for the corresponding instructors (posted to the course website).

Course Website: <https://learn.dcollege.net>

Note: Most of our communication will be by e-mail and via the course website. **Please check the course website and your Drexel e-mail account regularly. Make sure your Drexel e-mail account is set up correctly (see the instructions in the Welcome e-mail).**

Required Course Materials:

Note: Please read the **CHEM 102 welcome e-mail** for instructions. This e-mail is also posted to the course website, in case you did not receive it.

If you took CHEM 101 at Drexel University last fall, you do NOT need to purchase ANY new materials.

Textbook:

Nivaldo Tro, *Chemistry: Structure and Properties*, Pearson, Ed: 2015.

Laboratory Manual:

E. Thorne, *Laboratory Manual for General Chemistry, Drexel University, CHEM 101/CHEM 102 Academic Year 2014-2015.*

Supplementary Materials

a) **MasteringChemistry access code**, either as part of the textbook bundle OR purchased separately.

Notes:

a₁) MasteringChemistry access codes cannot be shared or reused and are valid for 24 months.

a₂) **Do not lose the access card or you will be required to purchase a new code to replace it.**

b) A **simple scientific or graphing calculator** for use in labs and exams.

Note: A periodic table and the values for constants will be provided as part of your test package at the time of each exam.

c) A pair of **safety glasses or goggles** and a **lab coat** that **must** be worn **at all times** in the laboratory.

1. Grading Structure:

Activity	% Grade	Additional Information
Exams	35	See section 3.
Final Exam	25	See section 4.
MasteringChemistry Assignments	10	Do NOT register for MasteringChemistry before reading the instructions sent to you as a pdf file attached to the Welcome e-mail.
Recitation	10	See section 5.
Lab	20	See section 6.
Total	100	

Grading policy:

Exact grade boundaries will be determined at the end of the term. As a general criterion, students who meet all the requirements will earn grades in the following ranges: **A- to A+** if they score **at least 90%** overall; **B- to B+** if their final score **≥ 80%**; **C- to C+** if final score **≥ 70%**; **D to D+** if final score **≥ 60%**. **There is no D- and no rounding** in this course. Questions about final grades should be raised as soon as

possible. **Please feel free to contact your corresponding instructors for any questions about your grades.** The course instructor(s) may contact you via e-mail if there are problems with your grades.

2. Lectures:

Lectures will be given on topics and sections of the text listed in the Course Schedule (see p. 8). Some of the subject matter not covered in lecture will be covered in lab. Some of the lecture material will be posted to the course website, while some things will be discussed only in class. Therefore, **constant attendance in lectures is highly recommended.** Not all required material will be covered in lecture. You are responsible for all material in the sections of the text listed on the Course Schedule, whether covered in lecture or not. The Course Schedule is provided as a guide and will be revised if dictated by prevailing circumstances (e.g., pedagogical purposes; level of students' knowledge, etc.). **Cell phone use is disruptive to the classroom environment; hence instructors have the right to prohibit it during class.**

3. In-term exams: non-cumulative

Three, 50 min exams will be given as indicated in the Course Schedule (see p. 8). Each in-term exam will consist of about **25 multiple-choice questions.** **Exams may include questions on lab material.** The average of the three in-term exams will represent **35% of the final grade** for the course.

After the exam starts, no student will be allowed to leave the testing room without handing in the exam. **Once a student leaves the testing room, he/she will not be allowed to re-enter it for any reason.** Students arriving late to the exam, after any other student has left, will not be permitted to take the exam. All students are responsible for bringing to the exam their own operational writing instruments and calculators - **no sharing will be allowed.** A periodic table, some formulas, and values of important constants will be provided as needed. **No other materials will be allowed.**

It generally takes 2-5 school days for grades to be reported back to students.

Active cell phones and the use of random-access devices (e.g., MP3 players, tablets, iPods) are NOT ALLOWED in exam rooms. **Cell phones MAY NOT be used as a calculator on exams.**

There will be an opportunity during the last week of classes to make up **ONLY ONE** missed exam. The make-up exam will include material covered after the third exam and will be taken at the same time by all students who are eligible to take it. **To be eligible to take the make-up exam, a student must e-mail Dr. Ilies as soon as possible with a reasonable explanation for missing the initial exam.** Eligible students will be notified by email regarding the date, time, and location of the exam. *The make-up exam can only be used to replace a missed exam, NOT to improve a grade on an exam that was taken.* There will be **no opportunity to retake the make-up exam**, regardless of the reason for missing it.

4. Final Exam: cumulative

The final exam will be a **2 hrs exam** held during the final exams week. The date, location and start time will be set by the University, announced in class, and posted to the course website. The final exam will consist of about **45 multiple-choice questions** and will represent **25% of your final grade.** A student who **a) did NOT score at least 45 on the final exam AND b) also received a failing grade (that is, less than 60) on one of the in-term exams will NOT pass the course**, regardless of his/her prior performance in the course.

All rules mentioned in Section 3 apply to the final exam, too. There is NO MAKE UP FOR THE FINAL EXAM. Students MUST be present for the final.

Final Exam Week is Tue, March 17th – Sat, March 21st. Students should expect to be at Drexel the entire week. The final exam will NOT be rescheduled to accommodate travel plans.

5. Recitations:

Recitations are designed to give you experience in explaining and working problems. The recitation instructors are prepared to answer *any* questions in this chemistry course, but priority will be given to those on the current subject matter. Students are expected to solve the **problems assigned for Recitation** (listed in the **Course Schedule** - see p. 8) **before** coming to class. It is also expected that **students in the honors sections** will have fewer questions about the regular problems assigned for recitation, since they are supposed to have a better background for a deeper understanding of the material. Consequently, **additional problems** with a higher degree of difficulty are assigned to these sections. The aim is for honors students to develop specific critical thinking skills.

Recitation grades will be determined based on both **participation and attendance**. Since there are 10 recitations, each missed recitation will translate into 10 points lost (5 points for attendance and 5 points for participation). If you cannot attend your regularly scheduled recitation, you **must** attend another recitation **that same week** and sign in, with that instructor's permission, to earn credit for that week. **You must notify your regular instructor to let him/her know that you attended another recitation.** You do NOT need to inform the course coordinator about the make-up of your recitations. **You may only make up 3 recitations during the term.** **Students are responsible for finding the schedule of a different recitation section that they would like to attend (the following link https://duapp2.drexel.edu/webtms_du/app can be used to check the online Term Master Schedule).**

Note: Recitations scheduled to meet on **Mon, Jan. 19th** (MLK University Holiday), will be **cancelled**.

Students in these sections are encouraged to attend another recitation that week, but will **NOT** lose points if they do not attend another recitation. **These students will have an extra recitation on Mon, Mar. 16th, so all students have 10 recitation classes.**

6. Laboratories:

Laboratory supplements the course material by offering you training in basic experimental techniques, as well as in recording and reporting of experimental results. **You will have a chemistry lab every other week, beginning in week 2 for even-numbered lab sections OR week 3 for odd-numbered lab sections** (see the **Laboratory Schedule** on the next page).

Laboratory Schedule: Disque Hall (see the Note below for exceptions)

	Lab 1	Lab 2	Lab 3	Lab 4

Title	Exp. # 5 Ester Preparation (non-Honors only) OR Exp. #9 Separating Mixtures (Honors only)	Exp. #6 Kinetics of Alcohol Oxidation	Exp. #7 Acids & Bases	Exp. #8 Electrochemical Cells
Even Number Lab Section	Week of January 12 th	Week of January 26 th	Week of February 9 th	Week of February 23 rd
Odd Number Lab Section	Week of January 19th *	Week of February 2 nd	Week of February 16 th	Week of March 2 nd

***Note:** Labs for sections 63, 65, 67, 69 will NOT run on Mon, Jan. 19th (MLK Holiday). These labs will run on Mon, Jan. 12th, in Disqué 302, at the same time as the originally scheduled labs.

For each lab experiment, each student is required to submit an individual lab report. The average of the scores for all lab reports **MUST** be at least 55% to pass the course. If you are retaking CHEM 102, you may be able to use the lab grade you earned during the previous term. You **must** contact the course coordinator to determine if you are eligible to take advantage of this opportunity.

Lab reports are due **one week after you do the lab** (same day, before the building closes at 10 PM). You should submit your lab report by placing it in your **lab instructor's slot box** (across from Disqué 304 - see the yellow sign on the mail slot furniture, in the hallway, near the entrance to the Chemistry Office). Ensure that the **cover page** of your report displays: **your name and the name of your instructor**; course number; **lab section number**; and the title of the experiment. A **blank cover page** and **grading rubrics** are available on the **course homepage** in the "Lab Reports Info" folder. To write lab reports, **use the corresponding grading rubrics** posted to the course website in the "Lab Info" folder and **all the additional information** given in the "Treatment of the Data" section for each experiment in your lab manual.

You are required to submit a **legible, handwritten procedure at the beginning of each lab**, which is worth **5 points** of your lab report grade. This procedure should be a **brief summary** (between half- and one-page long) of the **Experimental Procedure subsection** that is part of each experiment in your lab manual (write the summary of the experimental procedure as steps, with bullets). If you do not hand in this procedure, you will still be allowed to complete the lab, but you will lose the 5 points associated with that report component. **Late submissions of the procedure will not be accepted. The handwritten lab procedures will be signed by the instructor, and then attached to your lab report when you hand it in the following week.**

Data sheets must be attached to the corresponding lab reports and **must be signed by the instructor prior to your leaving the lab**. Data sheets **may be shared with your lab partner only!**

You may collaborate with lab partners on the calculations, but the rest of the report must represent your individual work. **Any lab reports that are full or partial copies of any other source will receive zero (0) points. Five points** will be deducted for **each day** (NOT including weekends or holidays) that **the lab report is late**. Lab reports submitted **more than 2 weeks late** will **NOT** be accepted. **Failure to submit**

the lab report after performing an experiment will result in **not more than 20 points** score for that lab (15 points for the signed data sheet + 5 points for the handwritten lab procedure).

Everyone MUST wear a long-sleeve lab coat and safety glasses or goggles while in the lab. Prescription glasses must be covered with safety goggles unless written documentation is provided to the instructor that indicates that the lenses meet or exceed the ANSI Z87 1-1989 standard and are equipped with side shields. **Bare legs (i.e., shorts or short skirts/dresses) or open-toed shoes are NOT ALLOWED.** All students must sign a form stating that they understand and will abide by this policy prior to being allowed to work in the lab.

If you are more than 5 minutes late to lab, you will NOT be permitted to perform the experiment at that time. You can make up ONLY ONE experiment during the make-up lab week (see the course schedule on pg. 8). Therefore, you are strongly advised to attend all of your regularly scheduled lab sessions or make up a missed lab in another section during the 2 weeks in which the same experiment runs.

Notes: 1) Make-up labs at the end of the term DO NOT run in the same room or at the same time as your regular labs. You will be informed about the location of the make-up labs during lectures and through the course website.

2) The make-up lab day can **ONLY** be used for experiments that were missed, NOT to improve a lab grade OR to redo an experiment where a lab report was never submitted.

7. Academic Honesty and/or Cheating:

Students are held to the highest expectations and standards regarding honesty in all aspects of the course, including taking exams and in the preparation of laboratory reports. Cheating, **including misrepresentation of the work of others as your own**, will not be tolerated. **Please understand plagiarism and do NOT commit it.** Cases of cheating will be reported to the College of Arts and Sciences and the University. **Students caught cheating will receive a failing (F) grade** for the assignment and/or course.

For more information, see material in “Academic Dishonesty” under the “Academic Policies” tab at the following link: http://drexel.edu/studentaffairs/community_standards/studentHandbook/

8. Disability Services:

Students with disabilities should see material under the “Health and Disability Services” tab at the following link: http://drexel.edu/studentaffairs/community_standards/studentHandbook/

Students with disabilities who wish to request special accommodations at Drexel University need to present a current accommodation verification letter (“AVL”) to one of the instructors before accommodations can be made. AVL's are issued by the Office of Disability Resources (“ODR”); <http://www.drexel.edu/oed/disabilityResources/Overview>. **Once submitted, the AVL letter is valid for all exams, including the final exam.** Any student requesting special testing accommodations must contact Dr. Ilies at least seven (7) days prior to the exam. **Accommodations will NOT be made if the AVL is first provided on the day of the exam.**

How Will You Learn Chemistry in This Course?

It has been our experience in the past that, to do well in this course, you must spend at least two hours on chemistry for every hour you spend in class (three hours is recommended). However, the exact time of study needed to be successful depends on your previous background and personal style of study. **We recommend the following steps in your preparation for the exams: 1) attend lectures; 2) read the lecture notes and/or the textbook; 3) complete the online homework assignments associated with a particular lecture; 4) go through the review sheets provided for each exam; 5) take the self-assessment quizzes at the end of each textbook chapter (these quizzes are actually extra practice exams); and 6) take the practice exam, by yourself and without checking the Answers Key.** Also, **don't ignore the solved examples in the textbook, as well as the extra questions at the end of each chapter.** The assignments provided for recitation and online homework should prepare the "average" student to get the "average" grade. Higher grades require more practice. The more you practice chemistry (for example, by solving problems), the faster you will be able to get through the easy problems on an exam, and thus have more time to think about the more difficult ones.

Starting week 2, there is free tutoring (**no appointment necessary**) available for additional help in **Stratton 106. Tutoring hours will be announced during the first week of the term.**

**~ We wish you much success for the Winter term '15 at Drexel! ~
Drexel CHEM 102 Teaching Team**

Course Schedule

Week	Component	Monday	Tuesday	Wednesday	Thursday	Friday
1	Date	1/5/2015	1/6/2015	1/7/2015	1/8/2015	1/9/2015
	Lecture topic	11.11; 12.3 (real gases; no calc. ; intermolec. forces)		12.5-12.6 (phase changes)	12.7-12.8; 13.2 (specific propert. of H ₂ O; phase diag.)	
	Recitation	Ch. 11: 91, 92; Ch. 12: 34, 40, 42, 57, 67; Honors: Ch.11: 144				
	Lab	No lab this week				
2	Date	1/12/2015	1/13/2015	1/14/2015	1/15/2015	1/16/2015
	Lecture topic	22.2-22.3 (alkanes: isomers; chirality)	22.4-22.5 (nomencl.: alkanes, alkenes, alkynes; cis-trans isomers)	22.7-22.10 (arom. cmpds.; funct.gr.)		
	Recitation	Ch. 13: 19, 20; Ch. 22: 35, 37, 40, 46b&c, 52, 53a&d, 57a&d; Honors: Ch.22: 56c&d				
	Lab	Exp. 5 or 9 (Esters/Chromatography), even-numbered sections (and 063, 065, 067, 069)				
3	Date	1/19/2015	1/20/2015	1/21/2015	1/22/2015	1/23/2015
	Lecture topic	NO CLASSES		22.11-22.14 (funct.gr.; polymers)	13.5-13.7 (types of solids)	
	Recitation	(MLK day) Ch. 22: 70, 74a&d, 81, 85a&c, 91, 94, 100; Honors: Ch.22: 92, 95				
	Lab	Exp. 5 or 9 (Esters/Chromatography), odd-numbered sections (except 063, 065, 067, 069)				
4	Date	1/26/2015	EXAM 1 1/27/2015	1/28/2015	1/29/2015	1/30/2015
	Lecture topic	15.2-15.3 (reaction rate)	15.4-15.5 (orders; rate laws; t _{1/2})	15.6 (only E_a); 15.8 (catalysis)		
	Recitation	Ch. 13: 38, 39; Ch. 15: 27, 39, 41, 55; Honors: Ch. 13: 50				
	Lab	Exp. 6 (Kinetics), even-numbered sections				
5	Date	2/2/2015	2/3/2015	2/4/2015	2/5/2015	2/6/2015
	Lecture topic	16.1-16.3 (equil.: def.; K _c ; signif.; related reactions)		16.4-16.6 (K _p ; heterog. equil. ICE tables)	16.7-16.9 (Q; Le Châtelier pr. problem-solving)	
	Recitation	Ch. 16: 22, 33, 45, 47, 56, 71, 73a; Honors: Ch. 16: 23, 57				
	Lab	Exp. 6 (Kinetics), odd-numbered sections				
6	Date	2/9/2015	EXAM 2 2/10/2015	2/11/2015	2/12/2015	2/13/2015
	Lecture topic	14.2; 14.4-14.5 (solub. & solutions; no Henry's Law)		17.1-17.3 (acids & bases: intro)	17.4-17.5 (K _a & acid strength)	
	Recitation	Ch. 14: 26, 47, 61; Ch. 17: 33, 36, 40, 45; Honors: Ch. 17: 43				
	Lab	Exp. 7 (Titration), even-numbered sections				
7	Date	2/16/2015	2/17/2015	2/18/2015	2/19/2015	2/20/2015
	Lecture topic	17.6-17.7 (pH, % ioniz. no acids mixtures)		17.8-17.10 (K _b ; K _a -K _b ; no cations as acids; no calc. for polyprot.acids)	18.1-18.2 (buffers)	
	Recitation	Ch. 17: 53, 55, 63, 77, 91, 132, 133; Honors: Ch. 17: 85				
	Lab	Exp. 7 (Titration), odd-numbered sections				
8	Date	2/23/2015	EXAM 3 2/24/2015	2/25/2015	2/26/2015	2/27/2015
	Lecture topic	18.3-18.4 (buffers; titrations; indicators no weak bases w. strong acids)		18.5-18.6 (K _{sp})	19.1-19.4 (entropy)	
	Recitation	Ch. 18: 25, 45, 57a&c, 59, 83a&b, 92, 93a&b; Honors: Ch. 18: 54				
	Lab	Exp. 8 (Electrochemical cells), even-numbered sections				
9	Date	3/2/2015	3/3/2015	3/4/2015	3/5/2015	3/6/2015
	Lecture topic	19.5-19.6 (ΔG; spont. pred.)		19.7-19.9 (ΔG° calc.)	9.9; 20.2 (redox - no acid/base sol.)	
	Recitation	Ch. 19: 26, 30, 37c, 41a&b, 49, 61, 75; Honors: Ch. 19: 44				
	Lab	Exp. 8 (Electrochemical cells), odd-numbered sections				
10	Date	3/9/2015	3/10/2015	3/11/2015	3/12/2015	3/13/2015
	Lecture topic	20.3 (voltaic cells)		20.4-20.5 (stand. electro. pot. ΔG; E° _{cell} ; K)	20.6-20.7 (Nernst eq.; batteries)	
	Recitation	Ch. 9: 68; 69; Ch. 20: 40a&b, 49a&b, 57a, 59, 67; Honors: Ch. 20: 70a&b				
	Lab	MAKE UP LAB DAY: Tue, 3/10; 9-5 PM; rooms TBA				
11	Date	3/16/2015	3/17/2015	3/18/2015	3/19/2015	3/20/2015
		Review		FINAL EXAM WEEK (Tue, 3/17 - Sat, 3/21)		