

General Chemistry I (CHEM 101)

Fall Quarter, 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 that chemical reactions transform matter from one substance to another;
- answer qualitative questions about foundational chemistry topics, such as the electronic structure of atoms and molecules, properties of elements and compounds, and chemical bonding;
- solve quantitative problems involving chemistry topics, such as stoichiometry, thermochemistry, and properties of gases;
- 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: Wed, Fri; 12:00-12:50 PM; Disqué 103
- Dr. **Anthony Addison**; Chemistry Department; Office: Disqué 418
 - Lecture D: Tue, Thu; 1:00-1:50 PM; Disqué 103
- Dr. **Lee Hoffman**; Chemistry Department; Office: Disqué 417
 - Lecture E (Honors): Tue, Thu; 2:00-2:50 PM; Disqué 103
- Dr. **Daniel King**; Chemistry Department; Office: Disqué 509
 - Lecture A: Wed, Fri; 9:00-9:50 AM; Disqué 103
 - Lecture C: Tue, Thu; 11:00-11:50 PM; Disqué 103
- Dr. **Craig McClure**; Chemistry Department; Office: Stratton 418
 - Lecture F: Tue, Thu; 12:00-12:50 PM; 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 aboard” e-mail that is also posted on the course website in case you did not receive it).**

Required Course Materials:

Note: Please read the “CHEM 101 - Welcome aboard e-mail” for instructions about how to purchase/use course materials. [The welcome e-mail is also posted on the course website in case you did not receive it.](#)

All course materials will be used for CHEM 101 (to be offered in the Fall, Winter, and Summer Terms) and CHEM 102 courses (to be offered in the Winter and Spring Terms).

Textbook:

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

Note: You do not need to bring the textbook to any of your CHEM 101 classes. Therefore, you can purchase EITHER the e-copy OR the hardcopy of the textbook. The hardcopy can be a used copy from last year.

Laboratory Manual:

E. Thorne, *Laboratory Manual for General Chemistry, Drexel University, CHEM 101/CHEM 102 Academic Year 2015-2016*.

Note: Old copies of the lab manual **cannot** be used because the lab manual has been modified from previous years. Also, the lab manual contains original data sheets that you will need to work on.

Supplementary Materials

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

Notes:

- a₁) Unless you took CHEM-050 over the summer, the MasteringChemistry access codes must be new, cannot be shared or reused and are valid for 24 months.
- a₂) If you opt for buying course materials directly from Pearson, you DO NOT NEED a course ID for purchasing. Simply select "No" when asked about it. **The course ID number is needed ONLY to register for the online homework AFTER you buy the access code. The course ID will be unique for each lecture section and it will be provided during the first lecture.** If you buy the package “MasteringChemistry access code + e-book”, do not expect to get a separate number for the access code. Once the purchase is made online, you gain instant access to the e-book. Once you type in the course ID (after you receive it during the first lecture), you will have access to the online homework. **When registering for Mastering Chemistry, please use your Drexel e-mail address as the e-mail address and your Drexel ID number when asked for it. Your Drexel ID number is the 8-digit number, and NOT the Drexel username (e.g., abc12) associated with your Drexel e-mail account.**
- a₃) **Do not lose the access code or you will be required to purchase a new code to replace it. Do not forget the password for your Mastering Chemistry account.**

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

Note: A periodic table, key equations 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
In-term Exams	35	See section 3.
Final Exam	25	See section 4.
MasteringChemistry Assignments	10	Do NOT register for MasteringChemistry before reading the “Supplementary Materials” sections above and the “Mastering Chemistry Instructions” posted on the course website.
Recitation	10	See section 5.
Lab	20	See section 6.
Total	100	

Grading policy:

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 $\geq 80\%$; **C- to C+** if final score $\geq 70\%$; **D to D+** if final score $\geq 60\%$. Exact grade boundaries will be determined at the end of the term in a meeting with all lecturers. When determining grade boundaries, we consider student performance across all exams. **There is 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 topics 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.**

The lecture content for the “Honors” section will include more in-depth material. The “Honors” section will take a separate exam that will match their specific lecture content. Therefore, the “Honors” students are strongly advised to attend their lecture section during the term.

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 “Honors” section will take a separate exam at the same dates and times.** The average of the three in-term exams will represent **35% of the final CHEM 101 grade.**

Review sheets and a practice exam for each exam will be posted on the course website. A review session will be held before each exam. **The dates and times for the review sessions will be announced in class and posted on the course website.**

After each 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, key equations and values of important constants will be provided as needed. **No other materials will be allowed.**

It generally takes 2-5 school days for exam 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 week 11** 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 by 11/23/15 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 hour exam** held during 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 **45-50 multiple-choice questions** and represents **25% of your final grade.** **A student who a) does NOT score at least 45 on the final exam AND b) ALSO received a failing grade (that is, < 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, Dec. 8th – Sat, Dec. 12th. 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 presented each week. 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**

very same week AND you **MUST** 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 may only make up 3 recitations during the term.**

Notes:

- 1) Recitations scheduled to meet on **Fri, Sept. 25th**, and **Mon, Sept. 28th**, (**Papal visit**) will be **cancelled**. Students whose recitations are cancelled are encouraged to attend another recitation those weeks, but will **NOT** lose points if they do not do it. **The final recitation grade for recitation sections that cannot meet during the previously mentioned dates will be calculated out of 9 recitations instead of 10.**
- 2) Recitations that cannot meet on **Mon, Oct. 12th** (**Columbus Day**) will be **made up** on **Mon, Dec. 7th** (the last day of classes for the fall term).

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** below).

Laboratory Schedule: Disque Hall (see Notes below for exceptions)

	Lab 1	Lab 2	Lab 3	Lab 4
Title	Exp. #1 Spectroscopy	Exp. #2 Conductivity of Solutions	Exp. #4 Determination of Molar Mass by Freezing Point Depression	Exp. # 3 Stoichiometry and Limiting Reagents
Even Number Lab Sect.	Week of September 28 th *	Week of October 12 th *	Week of October 26 th	Week of November 9 th
Odd Number Lab Sect.	Week of October 5 th	Week of October 19 th	Week of November 2 nd	Week of November 16 th

- *Notes:**
- a) Labs for sections **64H, 66, 68H and 70** will **NOT** run on **Mon, Sept. 28th** (Papal visit). These labs will instead run on **Mon, Oct. 5th**, in **Disqué 302**, at the same time as the originally scheduled labs.
 - b) Labs for sections **64H, 66, 68H and 70** will **NOT** run on **Mon, Oct. 12th** (Columbus Day holiday). These labs will instead run on **Mon, Oct. 19th**, 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 online. **Instructions on how to write and submit your lab reports online are posted on the course website in the "Lab Reports Info" folder.** Data sheets **must be signed by the instructor prior to you leaving the lab** and may be shared with your lab partner only! **Data sheets must be uploaded as a separate file when you submit your lab reports.** A blank cover page and **grading rubrics** are also available in that folder. To write lab reports, **use the corresponding grading rubrics** and **all the additional information** given in the "Treatment of the Data" section for each experiment in your lab manual. **Lab reports are due one week after you do the lab. If you have any difficulty with the online submission of your lab report, you must contact your lab instructor to work**

out a solution BEFORE the deadline. 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** during the 2 weeks period will result in **not more than 15-20 points** score for that lab (15 points for the signed data sheet + 5 points for the handwritten lab procedure).

You are also 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 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 lab instructor will keep your handwritten lab procedures.**

The average of the scores for all lab reports **must be at least 55% to pass the course.** If you are retaking CHEM 101, 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.

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.** Please go to the “Lab Reports Info” folder on the course website for examples of plagiarism and please read **Section 7** of the syllabus: **Academic Honesty and/or Cheating.**

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 you 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 p. 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 for which you never submitted a lab report.

7. Academic Honesty and/or Cheating

Drexel University is committed to a learning environment that embraces academic honesty. In order to protect members of our community from results of dishonest conduct, the University has adopted policies to deal with cases of academic dishonesty. Please read, understand, and follow the academic policies on Academic Dishonesty located at http://www.drexel.edu/provost/policies/academic_dishonesty.asp

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 requesting accommodations due to a disability at Drexel University need to present a current Accommodation Verification Letter (AVL) to one of the CHEM 101 lecturers **at least seven (7) days prior to the exam** in order for the accommodations to be made. **Accommodations will NOT be made if the AVL is first provided on the day of the exam. Once submitted, the AVL letter is valid for all exams, including the final exam.**

AVL's are issued by the Office of Disability Resources (ODR). For additional information, visit the ODR website at <http://www.drexel.edu/oed/disabilityResources>, or contact the Office for more information:

215-895-1401 or disability@drexel.edu.

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

9. Add, Drop and Withdrawal Policies

You can **add this course until the end of week 2**: see http://www.drexel.edu/provost/policies/course_add.asp
If you add this course after the start of the term, you are responsible for completing ALL work that you may have missed.

You can **drop this course until the end of week 2**. The course will then be removed from your transcript:
see http://www.drexel.edu/provost/policies/course_drop.asp

The course withdrawal deadline is Fri, Nov 6th by 5 PM (i.e., the end of week 7). You will have received some graded work prior to this deadline. If you have any questions about your progress at any time of the term, please contact your corresponding instructors. If you choose to Withdraw, a “W” will be recorded in your transcript: see http://www.drexel.edu/provost/policies/pdf/course_withdrawal.pdf

How Will You Learn Chemistry in This Course?

From our past experience, 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 really depends on your previous background and personal style of study. **We recommend focusing on successfully completing the homework assignments as we go through the term and only AFTER you read the corresponding lecture notes and/or the textbook. Use the provided review sheets to go through recommended solved examples in the textbook and through specific questions from the self-assessment quizzes at the end of each chapter. These quizzes are actually extra practice exams.** Don't ignore the extra questions at the end of each chapter. The assignments provided 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 Fall term '15 at Drexel! ~

Drexel CHEM 101 Teaching Team

Course Schedule – CHEM 101 – FALL 2015

Week	Component	Monday	Tuesday	Wednesday	Thursday	Friday
1	Date	9/21/2015	9/22/2015	9/23/2015	9/24/2015	9/25/2015
	Lecture topic	1.1-1.3 (struct. det. propert.; matter; metric units; sci. meth.)		1.5; 1.8-1.9 (atomic theory; subat. particles; isotopes; av. atomic mass - no MS)	NO CLASSES	
	Recitation	Ch. 1: Cc: 1.2 (p. 8); 1.3 (p. 10); For practice: 1.1 (p. 11); 36, 46, 50, 97; Honors: 42, 81				
	Lab	No lab this week				
2	Date	9/28/2015	9/29/2015	9/30/2015	10/1/2015	10/2/2015
	Lecture topic	NO CLASSES	2.3-2.4; 2.6-2.8 (d; E; dim. analysis; from 2.6, only Example 2.6)	3.2-3.3 (light; photoelectric effect; Bohr model - no interference & diffraction)		
	Recitation	Ch. 1: 62, 64a&c, 86; Ch. 2: 16, 23, 52; Ch. 3: 40c, 46a; Honors: Ch. 2: 40, 70				
	Lab	Exp. 1 (Spectroscopy), even-numbered sections (except sections 64H, 66, 68H, and 70)				
3	Date	10/5/2015	10/6/2015	10/7/2015 (MC deadline)	10/8/2015	10/9/2015
	Lecture topic	3.5-3.6 (orbitals; quantum #; no uncertainty pr.)		4.1-4.3 (per. table; e ⁻ config.; shield.; Z _{eff})		
	Recitation	Ch. 3: 61, 62, 66, 69b, 71, 106; Ch. 4: 44, 46; Honors: Ch. 3: 98; 104				
	Lab	Exp. 1 (Spectroscopy), odd-numbered sections (plus, sections 64H, 66, 68H, and 70)				
4	Date	10/12/2015	10/13/2015	10/14/2015 (MC deadline)	10/15/2015	10/16/2015 EXAM 1
	Lecture topic	HOLIDAY	4.4-4.5 (orb. blocks; types of elem.; monoat. ions)		4.6-4.8 (Z _{eff} & per. trends)	
	Recitation	Ch. 4: 50b&c, 52a,b&d, 54, 60, 64a-c, 94, 104; Honors: Ch. 4: 127, 133				
	Lab	Exp. 2 (Conductivity), even-numbered sections (except sections 64H, 66, 68H, and 70)				
5	Date	10/19/2015	10/20/2015	10/21/2015 (MC deadline)	10/22/2015	10/23/2015
	Lecture topic	5.1-5.3; 5.6 (bonds type; formulas type – no empirical; no naming ; monoat. vs. polyat. ions; cmpds. vs. mixtures)		5.4; 5.7; 5.9-5.10 (Lewis str.; formula mass; molar mass; % composition)		
	Recitation	Ch. 5: 34a&b, 40, 74c, 78a&d, 80a&c, 84a,b&d, 89, 120; Honors: 137				
	Lab	Exp. 2 (Conductivity), odd-numbered sections (plus, sections 64H, 66, 68H, and 70)				
6	Date	10/26/2015	10/27/2015	10/28/2015 (MC deadline)	10/29/2015	10/30/2015 EXAM 2
	Lecture topic	6.3-6.5 (molec. & polyat. ions Lewis str.; formal charge; exc. to the octet rule)		6.2; 6.6 (bond properties)		
	Recitation	Ch. 5: 122; Ch. 6: 24, 28a,b&d, 34b&c, 46a&b, 50b&d, 52; Honors: Ch. 5: 139; Ch. 6: 88				
	Lab	Exp. 4 (Freezing point depression), even-numbered sections				
7	Date	11/2/2015	11/3/2015	11/4/2015	11/5/2015	11/6/2015
	Lecture topic	6.7-6.9 (VSEPR – geom. & approx. bond angles up to 6 e ⁻ pairs)		6.10; 8.2-8.3 (molec. polarity; stoichiom.)		
	Recitation	Ch. 6: 54, 58a,b&d, 72; Ch. 8: 16, 20, 34a,b&d, 38b&c, 42; Honors: Ch. 6: 62b-d				
	Lab	Exp. 4 (Freezing point depression), odd-numbered sections				
8	Date	11/9/2015	11/10/2015	11/11/2015 (MC deadline)	11/12/2015	11/13/2015 EXAM 3
	Lecture topic	8.4-8.5 (LR; yield: actual, theoretical, % yield)		10.1-10.4; 10.6 (quantifying heat & work; no pΔV calc.)		
	Recitation	Ch. 8: 59; Ch. 10: 34, 38, 44c, 52, 53, 60; Honors: Ch. 8: 70				
	Lab	Exp. 3 (Stoichiometry), even-numbered sections				
9	Date	11/16/2015	11/17/2015	11/18/2015	11/19/2015	11/20/2015
	Lecture topic	10.5; 10.7-10.9 (calorimetry; ΔH calc.)		11.2-11.3 (pressure; gases' laws)		
	Recitation	Ch. 10: 68, 69, 72, 76, 79; Ch. 11: 26a,b&d; 30; Honors: Ch. 10: 57				
	Lab	Exp. 3 (Stoichiometry), odd-numbered sections				
10	Date	11/23/2015	11/24/2015	11/25/2015	11/26/2015	11/27/2015
		Thanksgiving NO CHEM 101 CLASSES MONDAY-FRIDAY				
11	Date	11/30/2015	12/1/2015	12/2/2015 (MC deadline)	12/3/2015	12/4/2015
	Lecture Topic	11.4-11.5 (ideal gas law; appl.); 11.6 (p. 407-409); 11.7 (p. 414-415); 11.10 (stoich. w. gases)				Review
	Recitation	Ch. 11: 32, 34, 36, 44, 58, 65, 85; Honors: 89, 107				
	Lab	MAKE UP LAB: Tue (12/1) and Wed (12/2)				
12		12/07/2015 (MC deadline) Recitation (make-up for Columbus day) FINAL EXAM WEEK (Tue, 12/8 - Sat, 12/12)				