

**CHEM 7: Principles of Chemistry II**  
<https://moodle.drew.edu> (2010SP-CHEM-7-001)

**Instructor**

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**Class**

9:25-10:30am M, W, F (HS-4)

**Weekly Reviews**

Thursdays, 4:30-5:30 pm in S229. You are free to show up late or leave early.

**Office Hours**

M,W 11am-12pm; T 5-6pm  
or by appointment  
Open door policy: if my door is open, stop by.

**Required Course Materials**

1. *Chemistry: The Molecular Science* (3<sup>rd</sup> edition) by Moore, Stanitski and Jurs
2. Scientific calculator
3. Laptop computer with Excel
4. Active email account and access to Course folder on Drew network
5. Laboratory notebook

**Additional copies of all the books listed above are on reserve in the library.**

\*During the first week of class, you will also need to purchase the lab manual (\$25) and goggles (\$10, if you don't already have a pair) from Jackie Cress in room S218. These are absolutely required before stepping into each and every lab.

**COURSE OBJECTIVES**

This is the second semester of a two-semester sequence of general chemistry. The major objective of this course is to build on principles from Chem 6 in order to learn how to think about chemical reactions and how chemistry relates to the rest of science and life. In particular, an objective of this course is for you to be able to predict, for any given chemical reaction:

- **When will a reaction happen? (Thermodynamics)**
- **How fast will a reaction happen? (Kinetics)**
- **How far will a reaction progress? (Equilibrium)**

Learning outcomes: The successful completion of Chem 7 will contribute to your

- Ability to solve challenging problems
- Ability to think critically
- Ability to process information and interpret data
- Ability to work with others
- Ability to learn independently
- Ability to communicate qualitative observations and quantitative information

Specific course objectives:

1. Be able to describe both qualitatively and quantitatively the properties and behavior of solids, liquids and gases
2. Be able to describe what factors control thermodynamics, kinetics and equilibrium
  - Be able to apply these concepts to acid/base aqueous chemistry
  - Be able to apply these concepts to electrochemistry
  - Be able to apply these concepts to some basic principles of organic chemistry and biochemistry

Prerequisites: The successful completion of Chem 7 will require that you are comfortable and familiar with the skills you learned in Chem 6/6A, which include:

- Working with chemical equations (e.g. balancing chemical equations)
- Stoichiometry (e.g. converting between mass, moles, and no. of atoms/ molecules; calculating concentrations of aqueous solutions)
- Quantitative skills (e.g. working with algebra; analyzing and interpreting graphical information)

## COURSE OVERVIEW

**Classroom:** The classroom part of this course will consist of lectures and activities involving team learning and problem solving. After completion of an activity in class, you are expected to do the related exercises from the worksheets as well as the assigned readings and suggested problems.

### Assessments

#### Final Grade Calculation

		<u>Grading Scale</u>			
Quizzes:	15%	A	93-100	C	73-76
3 Mid-term Exams:	27-33%*	A-	90-92	C-	70-72
Final exam:	22-28%*	B+	87-89	D+	67-69
Lab:	20%	B	83-86	D	63-66
Team Performance	10%	B-	80-82	D-	60-62
TOTAL	100%	C+	77-79	F	≤59

In general, the following grading scheme applies:

A (excellent understanding, intelligent discussion of concepts, sound scientific arguments)

B (very good understanding of concepts and what they mean, ability to apply them)

C (understand concepts and how facts fit into them, recognize patterns in problems)

D (memorized the "facts" from class notes)

F (insufficient effort, performance)

Quizzes: Weekly quizzes will be given at the beginning of each Monday's class, except those days when an exam is given. **These quizzes will be cumulative, although an emphasis will likely be placed on more recently covered material.** Students must show up on time; no time extensions will be permitted. There will be no make-up quizzes. Occasionally, throughout the semester, take-home quizzes will also be assigned. Each student's lowest two quiz grades during the course of the semester will be dropped when calculating the final grade. This policy should account for athletic commitments, random illnesses, etc. encountered over the course of a semester.

\*Exams: Three in-class mid-term exams will be given throughout the semester. The final exam will be cumulative. No make-up exams will be given. Initially, the three mid-term exams will contribute 33% of your final grade (11% for each mid-term exam) and the final exam will contribute 22% of your Overall Grade. However, if (hypothetically) you performed very poorly on one of your mid-term examinations, you will have the opportunity to improve your performance through the final exam. If you score better on the final exam than on a mid-term, then the final exam will contribute 28% of your overall grade and your mid-term exams will contribute 27% of your overall grade (11% for the two highest mid-term exam scores and 5% for your lowest mid-term exam score).

Laboratory: You must be registered for a laboratory section. There are 6 sections of 7L and one section of 7AL. Missed labs must be made up even if you have a documented excused absence from the Dean. You must contact me and your lab instructor within 24 hours of a missed lab to assess the possibilities for making up a lab.

Punctuality and attendance in lecture: Please be respectful of me and your fellow classmates and show up to class on time. In addition to learning the material yourself, you are responsible for assisting the other members of your team in their understanding of the material. For this reason, attendance is required. You are allowed three unexcused absences without penalty. Any absence beyond this will result in a 2 point decrease (out of 20) in your Team Performance grade. For example, if you are absent five times, the highest your Team Performance grade can be is 16/20.

Team Performance: An important part of this course is to develop problem solving skills and the ability to work with others. Therefore, you will be assigned to a team of 3-4 students to work with for all of the in-class activities. Throughout the semester you will be asked to assess yourself and your teammates. Your grade for Team Performance can be broke down in the following manner:

2% Attendance and Punctuality (You can't be a team member if you aren't in class)

2% Self-Evaluation (How well do you feel you contributed to your team?)

2% Teammate Evaluations (How do your teammates see your efforts?)

4% Instructor Evaluation (How are your efforts viewed by an outsider?)

Evaluations will be based on the grading rubric provided on the next page. You should refer to this chart *frequently* throughout the semester to make sure you are fulfilling the criteria of being a productive team member.

Homework: Like learning to play a musical instrument, or the lyrics to a song, practicing everyday is the key to success. Suggested problems from your textbook will be announced in every class. At minimum, you should do these problems *and be able to explain your solutions*. Do them more than once, and do not hesitate to work on problems that were not suggested. The suggested problems will not be collected, but the **Monday quizzes will draw heavily from the homework, as well as the in-class activities.**

**Special circumstances:** If there are special circumstances, such as illness or other form of emergency, which should be taken into account with regard to any of the stated class policies, please inform me as soon as possible so that alternative arrangements can be made.

**Academic accommodations:** Should you require accommodations, you must file a request with the Office of Educational Affairs (BC 114, extension 3327). It is your responsibility to self-identify with the Office of Educational Affairs and to provide me with the appropriate documentation from that office at least one week prior to any request for specific course accommodations. There are no retroactive accommodations.

**Academic ethics and integrity policy:** You are expected to abide by the Drew University Standards of Academic Integrity. For the official policy go to: [http://www.depts.drew.edu/composition/Academic\\_Honesty.htm](http://www.depts.drew.edu/composition/Academic_Honesty.htm). Plagiarism, whether deliberate or unintentional, and cheating on examinations, are not acceptable. Any such incidents will be referred to the Academic Integrity Committee.

### Team Performance Rubric:

CATEGORY	4	3	2	1
<b>Contributions</b>	Always provides useful ideas when participating in the team and contributes a lot of effort.	Usually provides useful ideas when participating in the team. A strong team member who tries hard.	Sometimes provides useful ideas when participating in the team. A satisfactory team member who does what is required.	Rarely provides useful ideas when participating in the team. May refuse to participate.
<b>Focus</b>	Always stays focused on the task and what needs to be done. Very self-directed.	Focuses on the task and what needs to be done most of the time. Other team members can count on this person.	Focuses on the task and what needs to be done some of the time. Other team members must sometimes prod to keep this person on-task.	Rarely focuses on the task and what needs to be done. Lets others do the work. Is a distraction to others trying to work.
<b>Monitoring Team Effectiveness</b>	Always monitors the effectiveness of the team and makes suggestions to make it more effective.	Routinely monitors the effectiveness of the team and works to make the team more effective.	Occasionally monitors the effectiveness of the team and works to make the team more effective.	Rarely monitors the effectiveness of the team and does not work to make it more effective.
<b>Preparedness</b>	Always comes prepared for class.	Usually comes prepared to class.	Sometimes comes prepared for class.	Often comes to class unprepared.
<b>Readiness to work</b>	Always gets to work immediately.	Usually gets to right to work.	Sometimes has difficulty settling down and getting to work	Always has difficulty settling down and getting to work
<b>Problem-solving</b>	Actively looks for and suggests solutions to problems.	Refines solutions suggested by others.	Does not suggest or refine solutions, but is willing to try out solutions suggested by others.	Does not try to solve problems or help others solve problems. Lets others do the work.

**COURSE SCHEDULE (SUBJECT TO CHANGE)**

<b>Week (class day)</b>	<b>Dates</b>	<b>Topic</b>	<b>Moore et al.</b>
1 (1-3)	Jan 25-Jan 29	Liquids and Solids	11
2 (4-6)	Feb 1-Feb 5	Thermodynamics ( <b>When?</b> )	18
3 (7-9)	Feb 8-Feb 12	Thermodynamics ( <b>When?</b> )	18
4 (10-12)	Feb 15-Feb 19	Chemical Kinetics ( <b>How Fast?</b> )	13
5 (13-15)	Feb 22-Feb 26	<b>Exam 1 (Mon, Feb 22)</b> Chemical Kinetics ( <b>How Fast?</b> )	13
6 (16-18)	Mar 1-Mar 5	Chemical Equilibrium ( <b>How Far?</b> )	14
7	Mar 8-Mar 12	<b>SPRING BREAK!</b>	
8 (19-21)	Mar 15-Mar 19	Chemical Equilibrium ( <b>How Far?</b> )	14
9 (21-24)	Mar 22-Mar 26	Solutes and Solutions	15
10 (25-26)	Mar 29-Mar 31*	<b>Exam 2 (Mon, Mar 29)</b> Acids and Bases	16
11 (27-29)	Apr 5-Apr 9	Acids and Bases Additional Aqueous Chemistry	16 17
12 (30-32)	Apr 12-Apr 16	Additional Aqueous Chemistry	17
13 (33-35)	Apr 19-Apr 23	Electrochemistry	19
14 (36-38)	Apr 26-Apr 30	<b>Exam 3 (Mon, Apr 26)</b> Electrochemistry, Special Topics	19
15 (39)	May 3*	Special Topics	

\* Short weeks (less than 3 classes)