

Chemistry 1212
Principles of Chemistry II
Spring 2019



Instructor: Dr. Martin R. McPhail
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Office Hours: M/Tu/W/Th 1:30 pm – 3:30 pm
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Course Information

Class: Chem 1212 (11 – 10201; 12 – 10202; 13 – 10203; 14 – 10204)

Meeting Times: Lecture – M/W 11:00 am – 12:15 pm (Sections 11, 12, 13, 14)
Workshop – Th 10:00 am – 11:30 pm (Section 11)
W 5:00 pm – 6:30 pm (Section 12)
Th 8:00 am – 9:30 am (Sections 13, 14)

Room: TLC 1301 (Lecture)

Modified Mastering Chemistry Course ID: mcphail26543

Course Description

Second course in a two-semester sequence covering the fundamental principles and applications of chemistry for science majors. Topics to be covered include chemical bonding, properties of solids, liquids and gases, solutions, equilibria, acids and bases, solubility, thermodynamics, kinetics, and electricity.

Required Materials:

Chemistry: Structure and Properties (2nd ed.) by Nivaldo J. Tro

Registration Code for Modified Mastering Chemistry program (included with new textbooks or available at www.pearsonmylabandmastering.com/northamerica/)

iClicker (available at the bookstore) either Gen 1 or 2

Learning Outcomes

1. *Foundational Knowledge:* Students will be able to use chemical terminology to describe chemical equilibria, kinetics, and phase behavior.
2. *Foundational Knowledge:* Students will be able to apply logical and mathematical reasoning skills to interpret provided chemical information.
3. *Application:* Students will apply their knowledge and thinking skills to interpret chemical observations.
4. *Integration/Caring:* Students will draw connections from course material to topics in other fields of study and modern scientific issues.
5. *Learning to Learn:* Students will develop methods for structuring their study habits, assess personal strengths/weaknesses, become a member of a learning team, and actively engage with text-based materials.

Course Assessment

Students' progress towards mastery of the learning outcomes will be tracked and assessed via:

Workshop (10%)

Workshops are a key component of the department's strategy to facilitate cooperative learning through peer-led, group work. Developing the skills to work and learn as a part of a team are fundamental to success at the undergraduate, graduate, and professional levels. Your attendance, participation, and performance in workshop will contribute towards your final grade.

Homework (10%)

Homework will be assigned and graded through the Pearson Modified Mastering Chemistry program. There will be a homework assignment posted **after each class period** and due **before the start of the following class**. This assignment will cover advanced application of the concepts covered in the previous lecture and basic ideas for the next lecture, so you will need to review material covered in the previous lecture as well read the sections from the text that will be covered in the next lecture. **10% credit is deducted per day late on any assignment.**

Clicker Questions (10%)

Questions will be posed at various points during lecture to enable interactive feedback between students and instructor. Responses will be tracked and logged through the iClicker system, so it is necessary for you to bring a functioning iClicker to every class period. **Using an iClicker registered to another student is cheating.** Textbook sections listed on the schedule below should be read *prior* to class to prepare for potential questions.

Mid-term Exams (12.5% each; 50% total)

Four mid-term exams will be given in-class over the course of the semester. These exams will not be comprehensive; each exam will cover material covered in lecture since the previous exam. **Non-graphing calculators will be permitted** on each exam, but notes, reference materials, and devices with additional app functionality are not. A periodic table and sheet of equations will be provided with each exam. Sharing of calculators is prohibited.

Final Exam (20%)

The final will be the American Chemical Society standardized test, which will cover **both Chemistry 1211 and 1212**. **Graphing/programmable calculators are not allowed on the final exam.** The Final Exam score will replace the single lowest midterm exam score if the final exam score is higher.

Grading Scale

A	90 – 100
B	80 – 89
C	70 – 79
D	60 – 69
F	0 – 59

Grade Calculation Formula

$$\begin{aligned} \text{Grade \%} = & [(\text{WS \%}) * 0.1] + [(\text{HW \%}) * 0.1] + [(\text{Clicker \%}) * 0.1] \\ & + [(\text{Exam 1}) * 0.125] + [(\text{Exam 2}) * 0.125] + [(\text{Exam 3}) * 0.125] \\ & + [(\text{Exam 4}) * 0.125] + [(\text{Final Exam}) * 0.2] \end{aligned}$$

Course Policies and Information

‘Curving’ Policy

In the event that the average exam grade falls below 75%, exam grades will be adjusted or ‘curved’ using a linear scale to ensure an average exam grade of 75%.

Extra-Credit Policy

No extra credit is accepted for this course.

Make-up Policy

No make-up work will be given for this course. If an emergency forces a student to miss a day’s clicker question or homework assignment, that assignment will be waived **only if official documentation is presented**. A maximum of **two exemptions total** will be allowed. Make-up exams will only be given for cases where an exam must be missed for the performance of a separate university-sponsored activity. Such cases must be reported to and approved by the instructor **no later than one week prior** to the date of the exam.

Student Conduct

Students are obligated to abide by conduct guidelines as described in the university catalog. Respect and courtesy of all students while in the classroom is required. The following are also mandatory:

1. Any disruptive behavior will result in your expulsion from the room. If disruptive behavior persists you will receive a minimum of a one letter-grade deduction from your overall grade as well as possible additional action depending on the severity of the behavior.
2. All electronic devices must be silenced during lecture. Calls may only be answered in the case of emergencies by stepping out into the hall. **Laptops and tablets are permitted**, but if your use of these devices becomes disruptive their use will be disallowed for the remainder of the semester.

Please feel free to contact me with any questions regarding the above. Following “common sense” behavior should prevent any of the above problems. Failure to adhere to conduct guidelines could result in *dismissal from class, a deduction from your final course grade, as well as further disciplinary action*.

University Policies and Academic Support

Please review the Common Language for all university course syllabi at the address:

https://www.westga.edu/administration/vpaa/assets/docs/faculty-resources/common_language_for_course_syllabi_v2.pdf

This document contains important information regarding Academic Support, Online Courses, Honor Code, Email Policy, Credit Hour Policy, and HB 280 (Campus Carry).

Academic Honesty

Any form of academic dishonesty—including but not limited to cheating or plagiarism—will result in a failing grade on the relevant assignment as well as possible additional action. Please be familiar with the definitions of academic dishonesty and plagiarism as laid out in the Student Handbook, which can be found at the link: <http://www.westga.edu/handbook/>

Disabilities Act / Accessibility for the Course

If you are a student with a disability as defined under the Americans with Disabilities Act and require assistance or support services, please notify me and provide me with a copy of your packet from Student Services. The university will provide you with resources for any audio/visual needs that you may have with the learning management system or course content.

It is critical that you contact UWG Accessibility Services immediately to find out what accommodations are necessary so we can work together to facilitate your success in this class. Please consult the UWG Accessibility Services site <http://www.westga.edu/accessibility> or call (678) 839-6428 for more details regarding accessibility for this course.

Note on Syllabus Modifications

I reserve the right to modify this syllabus at any time during the course of the term, particularly with regards to course schedule. Students will be notified of all syllabus modifications. In a case where a substantial modification is required, I will reissue a revised syllabus.

Tentative Schedule

Readings are listed for the 1st edition (1E) and 2nd edition (2E) of Tro.

Week	Monday	Wednesday
1	January 7 2E: 11.2, 11.3 1E: 12.2, 12.3 Review of Molecular Structure Intermolecular Forces	January 9 2E: 11.4, 11.5 1E: 12.4, 12.5 Surface Tension, Viscosity, Capillary Action Vaporization/Vapor Pressure
2	January 14 2E: 11.6, 11.7 1E: 12.6, 12.7 Sublimation/Fusion Heating Curves	January 16 2E: 11.8, 13.2, 13.3 1E: 13.2, 14.2, 14.3 Phase Diagrams Solubility & Solution Energetics
3	January 21 NO CLASSES	January 23 2E: 13.4, 13.5 1E: 14.4, 14.5 Solution Equilibria Concentration Units
4	January 28 2E: 13.5, 13.6 1E: 14.5, 14.6 Concentration Units Continued Colligative Properties	January 30 2E: 13.7 1E: 14.7 Colligative Properties Continued
5	February 4 Exam 1	February 6 2E: 14.2 - 14.4 1E: 15.2 – 15.4 Collision Theory Definition of Reaction Rates Differential Rate Laws
6	February 11 2E: 14.5 - 14.6 1E: 15.5 - 15.6 Integrated Rate Laws & Half-Lives Arrhenius Theory	February 13 2E: 14.7 - 15.5 1E: 15.7 – 16.5 Reaction Mechanisms & Catalysis Equilibrium Constants
7	February 18 2E: 15.6 - 15.8 1E: 16.6 - 16.8 Reaction Quotients Calculating Equilibrium []s	February 20 2E: 15.9 1E: 16.9 Le Châtelier's Principle
8	February 25 Exam 2	February 27 2E: 16.2 - 16.4 1E: 17.2 – 17.4 Acid/Base Strength <i>Last day to Withdraw</i>
9	March 4 2E: 16.5 - 16.8 1E: 17.5 – 17.8 K_w , K_a , and K_b pH, pOH, pK_a , pK_b Strong Acid & Base Calculations	March 6 2E: 16.7, 16.8 1E: 17.7, 17.8 Weak Acid & Base Calculations
10	March 11 2E: 16.9, 16.11 1E: 17.9, 17.11 pH of Salt Solutions Lewis Acids and Bases	March 13 2E: 17.2, 17.3 1E: 18.2, 18.3 Buffers Henderson-Hasselbalch

11	March 18 NO CLASSES	March 20 NO CLASSES
12	March 25 2E: 17.4 1E: 18.4 Acid/Base Titrations	March 27 2E: 17.5 - 17.7 1E: 18.5 - 18.7 Solubility Product Formation Constant
13	April 1 Exam 3	April 3 2E: 18.2 - 18.4, 18.7 1E: 19.2 - 19.4 Entropy and Spontaneity Changes in Entropy
14	April 8 2E: 18.5, 18.6 1E: 19.5, 19.6 Entropy of Surroundings Gibbs Free Energy	April 10 2E: 18.8 - 18.10 1E: 19.7 - 19.9 ΔG for Nonstandard Cond. Calculating K from ΔG
15	April 15 2E: 19.2 1E: 20.2 Identifying and Balancing Redox Reactions	April 17 2E: 19.3, 19.4 1E: 20.3, 20.4 Galvanic Cells Standard Electrode Potentials
16	April 22 2E: 19.5, 19.6 1E: 20.5, 20.6 E°_{cell} , ΔG° , and K E_{cell} for Nonstandard Conditions	April 24 2E: 19.7, 19.8 1E: 20.7, 20.8 Batteries and Electrolysis
17	April 29 Exam 4	

Final Exam: See Date and Time Posted by the Registrar (*Note that sometimes these dates change before the end of the semester. Keep up to date with the link below*).

https://www.westga.edu/student-services/registrar/spring_2019_exam_schedule.php