

Chemistry 1312.D30
General Chemistry II
Summer II 2020
July 6 – August 5, 2020
9:00 – 10:45 am MTWRF

Dr. Janet L. Maxwell
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Location of Office: Collaborate
Office Hours: MTWRF 8:00 – 9:00 am
or by appointment (email me and I'll meet
you in collaborate)

Required Texts:

- SmartWork online homework **[Both Required]**: Thomas R. Gilbert, Rein V. Kirss, Natalie Foster, Stacey Lowery Bretz, Geoffrey Davies, *Chemistry: The Science in Context* (5th edition, 2018). Note: The online version of the textbook is included with Smartwork.

Also Required:

- A scientific calculator (Bring your calculator to class every day)
- A Webcam

Course Description: A continuation of the study of the fundamental laws and theories of chemistry, chemical nomenclature, chemical equilibrium, metals and non-metals and their compounds, and introduction to nuclear chemistry.

Prerequisites: Chem 1311 and Chem 1111 are to be completed with a grade of C or better before Chem 1312. Proficiency in Algebra is required. Only students eligible to take a college-level math course may take Chem 1312.

Student Learning Outcomes:

After completion of this course students will be able to:

- Demonstrate technical and analytical skills in the area of general chemistry.
 - Students will be able to use the periodic table to determine basic atomic information and to predict trends in atomic properties.
 - Students will be able to interconvert between chemical names and formulas to the extent that they can work problems given only one of those pieces of information.
 - Students will be able to classify common types of chemical reactions and predict the outcomes of reactions.
- Analyze complex chemical problems and draw logical conclusions.
 - Students will be able to use an understanding of atomic structure at the basic and atomic levels to analyze the structure and reactivity of substances and chemical species.
 - Students will be able to use an understanding of how energy interacts with matter to predict stable chemical species, and perform thermodynamic calculations describing chemical reactions.
- Employ mathematics in the analysis of chemical problems.
 - The mole concept, chemical formulas and balanced chemical equations will be used to do chemical calculations that relate macroscopic measurements to numbers of atoms, ions or molecules.
 - Students will be able to do calculations involving solution concentration and know how to prepare solutions of given concentrations.
 - Students will be able to quantitatively predict gas properties using gas law calculations.
- Understand and apply scientific reasoning in the chemical sciences.
 - Students will be able to use an understanding of ions and molecules at the atomic level to predict the behavior of reactions in aqueous solutions.

- Students will be able to use the basic ideas of quantum mechanics to describe how molecular bonds form and to predict molecular shape and polarity. Molecular structure and polarity will be used to predict the forces between molecules and relate those forces to the states of matter and phase changes.

Grading:	Three One-Hour Exams	3 x 100 = 300 pts
	One Two-Hour Final Exam (comprehensive)*	1 x 150 = 150 pts
	Quizzes	10 x 10 = 100 pts
	(12 quizzes will be given; the 2 lowest quiz grades will be dropped; no make-ups will be given for quizzes)	
	Smartwork Online Homework Grade	100 pts
	Attendance	200 pts
	Lab Grade	<u>200 pts</u>
	Total =	1050 pts

Total weighted % of the total within the following ranges at the end of the semester guarantee the student at least the indicated letter grade:

- A 90% weighted total or better
- B 80-89% weighted total
- C 70-79% weighted total
- D 60-69% weighted total
- F less than 60% weighted total

Deadline:	Last Day to drop the course: Friday, July 24
Attendance Policy:	Roll will be taken each class period in collaborate. There are 23 class periods. Your attendance grade will be calculated by dividing the number of class periods you attended by 23 and then multiplying by 200.
Disabilities:	Persons with disabilities which may warrant academic accommodations must contact the Student Disability Services in order to request and to implement academic accommodations. Their email address is ADA@angelo.edu.
Quizzes	Quizzes will be given as shown in the course schedule in this syllabus. Instead of having the quizzes in class, they will be take-home quizzes, typically due at midnight the day they are assigned. Quizzes will be worth 10 points. Students can only take quizzes during regularly scheduled class periods on Collaborate. The student's lowest quiz grade will be dropped. Make-up quizzes will not be given for any reason.
Calculators	Students are expected to bring a scientific calculator to class every day, including days with quizzes or exams. The calculator may be a graphing calculator, or just a regular scientific calculator. You cannot depend on your cell phone to be able to calculate values in a chemistry class. The cheapest Texas Instruments calculator is a TI-30Xa for less than \$10 at Walmart or Walmart.com. Some students prefer the TI-30X IIS calculator which sells for a minimum of about \$13 at Walmart or Walmart.com. If you have a TI-83 or TI-84 from High School or a previous class, that is a great calculator too.

Make-up Exam Policy: You must have a valid excuse for missing an exam and Dr. Maxwell has the right to ask you for documentation of that. Instead of giving make up exams, exams you missed will get grades based on the comprehensive final exam. To calculate your missed exam score, Dr. Maxwell will take the number of questions on the final over the sections on the exam you missed that you got right and divide by the total number of questions on the final over the sections on the exam you missed and then normalize the grade to 100 points.

Policy on Academic Dishonesty: See the ASU Student Handbook for definitions of cheating and plagiarism. Any student who is caught cheating or plagiarizing in this class will be subject to failure in the course and possible suspension from the University. Cheating and/or plagiarism will not be tolerated! Angelo State University expects its students to maintain complete honesty and integrity in their academic pursuits. Students are responsible for understanding the Academic Honor Code, which is contained in both print and web versions of the Student Handbook.

Online Homework System: Smartwork is an online homework program which accompanies the Gilbert textbook. Although each chapter's total homework is worth 20 points, you will be assigned homework problems every night based on the material covered that day and you will not get credit for those problems unless you do them ontime. Although each homework assignment appears to be worth different values on the smartwork system, they will be normalized to be worth a total of 20 points for each chapter when entered into blackboard. To enroll in Smartwork, go to <http://wwnorton.knowledgeowl.com/help/smartwork5-students-getting-started>

You will need

1. A valid email address
2. The enrollment key for your course: **238394**
3. A registration code from W.W. Norton or the use of a credit card.

This proof-of-purchase allows you to access the course after your free two-week trial period expires.

The assignments and due dates for Smartwork can be found on the Smartwork home page for our course. Each homework assignment will be worth 25 pts. Homework grades cannot be dropped. **The enrollment key for our course is 238394.**

Blackboard Collaborate: All classes will be held in a Blackboard Collaborate session. There is an attendance grade worth a total of 200 points out of 1050 for attendance. There are 23 class periods. Your attendance grade will be calculated by dividing the number of class period you attended live in Collaborate by 23 and then multiplying by 200. You must attend the live sessions in order to get the attendance credit.

Webcams: Webcams are required for this course. The webcams usually come with a microphone. Most laptop computer have webcams.

	Date	Lecture:	Other:
M	July 6	Chapter 10: Intermolecular Forces: Solubility, Vapor Pressure and Phase Diagrams Homework assigned	
T	July 7	Chapter 10, cont. Homework Assigned Quiz 1 (take home) due midnight	11:00 Lab Class Introduction to Labs Graphing Submitting Lab Reports to Gradescope
W	July 8	Chapter 11: Solutions - Vapor pressure, solubility of gases in water, dissolution of ionic compounds, mixtures of volatile solutes, colligative properties Homework assigned Quiz 2 (take home) due midnight	11:00 am Lab Class Lab 1: Colligative Properties - Freezing Point Depression
R	July 9	Chapter 11, cont. Homework Assigned Quiz 3 (take home) due midnight	11:00 am Lab Class Lab 2: Qualitative Analysis
F	July 10	Chapter 12: Solids The solid state, structures of metals, alloys, metallic bonds, semiconductors, ionic solids, structures of nonmetals Homework Assigned Quiz 4 (take home) due Sunday at midnight	Lab 1 due Saturday, July 11 at midnight (submitted to Gradescope)
M	July 13	Chapter 13: Chemical Kinetics – Reaction rates, effect of concentration on rate, the Arrhenius equation, reaction mechanisms, catalysis Homework Assigned	11 am Optional Review Session for Exam 1
T	July 14	9:00 am Exam 1	12:30-1:45 pm Lecture Chapter 13, cont. Homework Assigned Lab 2 due at midnight (submitted to Gradescope)
W	July 15	Chapter 13, cont. Homework Assigned Quiz 5 (take home) due at midnight	11:00 am Lab Class Lab 3: Kinetics – Effect of Concentration

	Date	Lecture:	Other:
R	July 16	Chapter 14: Chemical Equilibrium – Writing equilibrium constant expressions, relationships between K_c and K_p values, manipulating equilibrium constant expressions, reaction quotients, heterogeneous equilibria, Le Châtelier's principle Homework Assigned Quiz 6 (take home) due at midnight	11:00 am Lab Class Lab 4: Kinetics – Effect of Temperature
	July 17	Chapter 14, cont. Homework Assigned Quiz 7 (take home) due Sunday at midnight	Lab 3 due Saturday, July 18 at midnight (submitted to Gradescope)
M	July 20	Chapter 14, cont. Homework Assigned	11 am Optional Review Session for Exam 2
T	July 21	9:00 am Exam 2	12:30-1:45 pm Lecture Chapter 15: Acid-Base Equilibria – the Brønsted Lowry model, pH and the autoionization of water, calculations involving pH, K_a and pK_a , polyprotic acids, acid strength and molecular structure, pH of salt solutions Homework Assigned Lab 4 due at midnight (submitted to Gradescope)
W	July 22	Chapter 15, cont. Homework Assigned Quiz 8 (take home) due at midnight	11:00 am Lab Class Lab 5: Equilibrium
R	July 23	Chapter 15, cont. Homework Assigned Quiz 9 (take home) due at midnight	11:00 am Lab Class Lab 6: Acid-Base Equilibrium
F	July 24	Chapter 16: Additional Aqueous Equilibria - the common ion effect, buffers, indicators, acid-base titrations, Lewis acids and bases, solubility equilibria SKIP Sections 16.6 & 16.7 Homework Assigned Quiz 10 (take home) due Sunday at midnight	Lab 5 due Saturday, July 25 at midnight (submitted to Gradescope)

	Date	Lecture:	Other:
M	July 27	Chapter 17: Thermodynamics – Spontaneous processes, entropy, the Third Law of Thermodynamics, calculating entropy changes, free energy, temperature and spontaneity, free energy and chemical equilibria, the standard hydrogen electrode, the influence of temperature on equilibrium constants, relating battery capacity to quantity of reactants, corrosion, electrolytic cells Homework Assigned	11 am Optional Review Session for Exam 3
T	July 28	9:00 am Exam 3	12:30-1:45 pm Lecture Chapter 17, cont. Homework Assigned Lab 6 due at midnight (submitted to Gradescope)
W	July 29	Quiz 10 (end of class) Chapter 17, cont. Homework Assigned Quiz 11 (take home) due at midnight	11:00 am Lab Class Lab 7: Buffers
R	July 30	Chapter 18: Electrochemistry – Balancing redox reactions, electrochemical cells, standard potentials, chemical energy and electrical work, the Nernst equation. Homework Assigned Quiz 12 (take home) due at midnight	11:00 am Lab Class Lab 8: Electrochemistry
F	July 31	Chapter 18, cont. Homework Assigned	Lab 7 due Saturday, August 1 at midnight (submitted to Gradescope)
M	Aug 3	Chapter 19: Nuclear Chemistry – Binding energy and nuclear decay, radioactive decay, rates of radioactive decay, radiometric dating, measuring radioactivity, biological effects of radioactivity, medical applications of radionuclides, nuclear fusion Homework Assigned	
T	Aug 4	Chapter 19, cont. Homework Assigned	11 am Optional Review for ACS Exam Lab 8 due at midnight (submitted to Gradescope)
W	Aug 5	9:00 am ACS Final Exam (one semester comprehensive)	

Note: the 2 lowest quiz grades will be dropped. No exam grades will be dropped.

Note: For the past 10 years, Dr. Maxwell has been stealing Tuesday Lab time for lecture. We will continue to do so, but in a more blatant way than usual.

