Note: Although Chem 1306 and 1106 are listed as two separate courses, they are in fact linked together in content in such a way that you must take them simultaneously. You will receive the same grade for Chem 1106 as for Chem 1306. Thus, if you drop one course without dropping the other, you will automatically fail the one you did not drop. **The records office will not automatically drop one course if you drop the other.** If you are not already enrolled in both Chem 1306 and 1106, contact Dr. Maxwell or your academic advisor to remedy this situation.

Dr. Janet L. Maxwell  
CAV 229B, 325-486-6624  
janet.maxwell@angelo.edu  
Office Hours: MWF 9:00 – 10:30 am  
TR 9:30 – 10:30 am  
or by appointment

**Required Texts:**

“General, Organic and Biological Chemistry”, 4th edition by Frost and Deal  


Also **Required:**  
1) Registration/Participation in the Sapling Learning For-Credit Homework Software System (ISBN: 978098338590)  
3) Academic/Daily Planner  
4) A scientific calculator (Texas Instruments is the recommended brand, but other brands are acceptable)  
5) Safety Goggles

**Course Description:**

An Introduction to General, Organic and Biological Chemistry with emphasis on the role of chemistry in health and illness. Intended for nurses and allied health professionals.

**Student Learning Outcomes:**

A. **Introduction to Chemistry** - Students will be able to:

1. Classify a sample of matter as a mixture, a compound, or an element; and describe a mixture as homogenous or heterogenous.

2. Know the names and symbols of common elements, the differences between metals, metalloids and nonmetals, and the organization of the periodic table.

3. Convert a measurement from one unit to another using a conversion factor, report a measured value to the correct number of digits, be able to use a calculator to carry out calculations, be able to round answers to the appropriate number of significant figures, be able to express numbers in scientific notation, to enter numbers in scientific notation correctly into the calculator, to understand the values of numbers expressed using scientific notation and to understand how to find the percent of a whole or the percent that one number is of another number.

4. Define mass and volume, and know how to express these properties using the metric system and define and solve for density and specific gravity and use density or specific gravity to solve for the mass or volume.
5. Understand and interconvert between temperature scales, understand units of energy and be able to calculate the specific heat of a substance.

6. Distinguish the bulk properties of the three states of matter, and relate these properties to the behavior of the particles that make up the substance.

7. Understand the difference between precision and accuracy.

8. Carry out dosage calculations and use percents in health care applications.

9. Determine whether a process is a physical change or a chemical reaction and write and balance a chemical equation to represent a chemical reaction.

B. Atoms and Radioactivity – Students will be able to:

1. Know the properties of the subatomic particles, and determine the mass and charge of an atom from the number of each type of subatomic particle.

2. Understand the concepts of atomic number and mass number and how these relate to the numbers of protons and neutrons in the nucleus of the atom.

3. Know how isotopes are related to one another, and understand the relationship of atomic weight to the masses of individual atoms.

4. Understand the concepts of radioactivity and radioisotopes and be able to describe and write the equations for the common types of nuclear decay.

5. Understand the units of radioactive disintegration and the concept of half-life.

6. Understand the most common medical applications for radioisotopes.

C. Compounds – Students will be able to:

1. Understand how electrons are arranged in an atom, write electron arrangements for the first 20 elements and understand the octet rule.

2. Predict ion charges for representative elements, and understand how atoms gain and lose electrons to form ions.

3. Predict the formulas of ionic compounds using the ion charges, and learn the names and charges of common transition metal ions.

4. Write the names and formulas of ionic compounds that contain two elements, learn the names and formulas of common polyatomic ions, and write the names and formulas of compounds that contain polyatomic ions.

5. Understand how covalent bonds are formed, use the octet rule to predict the number of covalent bonds an atom can form, draw Lewis structures for molecules that contain single bonds, draw Lewis structures for molecules that contain double or triple bonds, use lines to represent bonding electrons and write names for binary covalent compounds.

6. Use the mole concept to express numbers of formula units, interconvert between moles and masses, understand the significance of Avogadro’s number and use it to interconvert between numbers of atoms and masses in grams.

7. Determine the shapes of molecular compounds. use electronegativities to predict whether a covalent bond is polar or nonpolar, determine the type of charge on each bonding atom and determine the polarity of molecules containing more than one covalent bond.

D. Introduction to Organic Compounds – Students will be able to:

1. Explain why carbon is uniquely suited to be the main structural element of organic chemistry, and describe the ways in which carbon atoms form covalent bonds.

2. Learn the names of the first 10 linear alkanes, and use common conventions to draw their structural formulas.

3. Classify fatty acids based on their structures.

4. Understand how and why chemists use functional groups to classify organic molecules and how alcohols and amines are categorized as primary, secondary or tertiary.

5. Distinguish linear and branched alkanes and cycloalkanes, and recognize and draw isomers of simple alkanes.

6. Name branched alkanes, cycloalkanes and haloalkanes.

7. Name and draw the cis and trans forms of cycloalkanes and alkenes, and distinguish between constitutional isomers and cis-trans isomers.
8. Understand the concept of chirality in organic chemistry and be able to distinguish stereoisomers from other types of isomers.

E. Carbohydrates – Students will be able to:
1. Understand the structural features and typical physical properties of monosaccharides, including the chirality of these molecules.
2. Understand the concept of organic oxidation and reduction reactions as applied to the concept of reducing sugars.
3. Understand the formation of ring structures in monosaccharides and the relationship between the anomers of a monosaccharide.
4. Understand, name and draw the structures of the most common glycosidic linkages in disaccharides and understand the breaking and forming of glycosidic bonds.
5. Describe the building blocks, linkages and biological functions of the common disaccharides and polysaccharides.
6. Understand the structure and function of the carbohydrate antigens in blood.

F. Intermolecular Forces – Students will be able to:
1. Describe the different types of intermolecular forces between molecules or ions, and relate the strength of these forces to physical properties.
2. Be able to name and define the phase changes.
3. Understand the rule of “like dissolves like” and how it applies to nonpolar compounds, polar compounds and ionic compounds, recognize hydrophilic and hydrophobic regions in a molecular compound, and rank the solubilities of structurally related compounds.
4. Understand the role of soap in removing oil and grease.
5. Understand the role of the strength of intermolecular forces in determining the melting and boiling points of substances.
6. Understand and apply the relationships between pressure, volume and temperature for a gas.
7. Understand the qualitative and quantitative aspects of Boyle’s Law and Charles’ Law and be able to predict the behavior of gases under changing conditions.
8. Understand the effect of saturation and unsaturation of fats on their melting points and distinguish between cis-unsaturated and trans-unsaturation fats.
9. Understand the structure and function of lipids in cell membranes.

G. Solution Chemistry – Students will be able to:
1. Identify the solute and solvent in a solution and distinguish between solutions, colloids and suspensions.
2. Describe and interpret the solubility of a compounds, and predict the effects of temperature and pressure on solubility.
3. Describe what happens when ionic and molecular compounds dissolve in water and distinguish between strong electrolytes, weak electrolytes and nonelectrolytes.
4. Determine the number of equivalents per mole for dissolved ions.
5. Calculate and use milliequivalents per liter, millimoles per liter, molarity, percent concentrations, other common concentration units involving masses of solutes.
6. Calculate the final volume or concentration of a solution in a dilution, and calculate the volumes of a concentrated solution and water needed to carry out a dilution.
7. Determine the direction of osmosis and dialysis, and predict the effect of a solution on red blood cells using the overall molarity of the solution.
8. Understand and explain the different modes of transports of substances across cell membranes.

H. Acids and Bases – Students will be able to:
1. Distinguish between Acids and Bases in aqueous solution.
2. Understand the definition of strong acids and strong bases.
3. Understand the concept of chemical equilibrium and the equilibrium constant and use Le Châtelier’s principle to predict the effect of a disturbance on a system at equilibrium.
4. Understand the definition of strong acids and use the value of $K_a$ or $K_b$ to determine which acid or base is strongest or weakest.
5. Write the equation for the ionization of an acid base in water and identify acid-base conjugate pairs.
6. Write the self-ionization reaction for water, and use the concentration of either hydronium or hydroxide ion to calculate the concentration of the other ion.
7. Relate the pH of a solution to the hydronium ion concentration, and use pH to determine the acidity or basicity of a solution.
8. Understand the concept of $pK_a$ and the relationship between pH and $pK_a$.
9. Recognize buffer solutions, describe how buffers resist pH changes, and estimate the pH of a buffer from the $pK_a$ of the acid and the concentrations of the buffer components.

Student Learning Outcomes will be evaluated using exam questions.

**Grading:**

Three One-Hour Exams  
(Each one hour exam will be worth 10.909% of the overall grade)  
3 x 150 = 450 pts

One Two-Hour Final Exam(comprehensive)  
(The Final Exam will be worth 14.545% of the final grade)  
1 x 200 = 200 pts

 Sapling Learning Online Homework Grade  
(The Sapling Homework will be worth 7.272 % of the final grade)  
100 pts

Top Hat Participation Grade  
(The Top Hat Participation will be worth 7.272 % of the final grade)  
100 pts

Quizzes  
(11 quizzes will be given and the one lowest quiz grade will be dropped – the sum of the quiz grades will be worth 10.909% of the final grade)  
10 x 15 = 150 pts

Lab Grade  
(14 labs will be completed and the one lowest lab grade will be replaced with a perfect score* – the sum of the lab grades will be worth 23.636% of the final grade)  
13 x 25 = 325 pts

Study Skills/Planner Work  
(the sum of the study skills work will be worth 3.636% of the final grade)  
50 pts

Total = 1375 pts

*Only students with a valid documented excuse can have one lab grade replaced with a perfect score.

Students are responsible for monitoring their own grades on Blackboard. The category in Blackboard that accurately reports the current grade is the “Weighted Average”. This column does not always appear on cell phones, but it does appear on a computer.

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

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90% of the total or better</td>
</tr>
<tr>
<td>B</td>
<td>80-89% of the total</td>
</tr>
<tr>
<td>C</td>
<td>70-79% of the total</td>
</tr>
<tr>
<td>D</td>
<td>60-69% of the total</td>
</tr>
<tr>
<td>F</td>
<td>less than 60% of the total</td>
</tr>
</tbody>
</table>
One Hour Exams:
The schedule for the one hour exams can be found on the schedule page for your section in this syllabus. Each one hour exam will consist of 30 multiple choice questions worth 5 points each. Questions will be in a random, scrambled order. **Students who arrive at an exam early/on-time will have the full class period to take the exam. Students who arrive more than 5 minutes late to an exam will have their exam paper taken away at the same time that the last early/on-time student finishes their exam.**

Final Exam:
See the schedule for the date and time of your final exam. The final exam will consist of 50 questions worth 4 points each. Half the final exam will consists of problems covered in the class after Exam 3. The other half of the exam will consist of problems from the material covered before Exam 3. Questions will be in a random, scrambled order.

Deadline:
Last Day to drop the course: Friday, November 1

Persons with disabilities which may warrant academic accommodations must contact the Student Life Office, Room 112, University Center, in order to request and to implement academic accommodations.

Quizzes:
Quizzes will be given in lecture as shown in the course schedule on the last page of this syllabus and in the table below. Quiz topics will include the material from the previous week’s lab and the sections associated with those topics from the textbook as well as additional sections as assigned in class. In order to study for the quizzes, you need to read the textbook sections listed for the quiz topic and work all the practice problems and additional problems listed in “Practice Problems and Additional Problems” handout on Blackboard. Quizzes will be worth 15 points. Eleven quizzes will be given and the one lowest quiz grade will be dropped. Make-up quizzes will not be given for any reason. Students who have not enrolled in Top Hat by Sept. 4 will be given a zero on all quizzes taken after that date until the clicker is registered. These zeros are irreversible.

Practice Problems:
On blackboard there is a document labeled “Practice Problems and Additional Problems by Section”, which can be found under course materials. At the end of each section, there is a list of practice problems and a list of additional problems. The answers to the odd-numbered practice problems and additional problems are given at the end of each chapter. You will be responsible for knowing what problems are assigned for each section to study for quizzes and exams. This information is given in the document labeled “Practice Problems and Additional Problems by Section” found under course materials on blackboard.

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. Students may NOT use cell phones in place of calculators during quizzes or exams.
Attendance Policy:

Roll will be taken each class period using the Top Hat clicker system. All students must enroll in Top Hat by Wednesday, Sept. 4. You will have an absence and zero participation for that class on your record for each class period without having purchased and registered your clicker. If you come to class late, there will be a sign-in/sign-out sheet by the door that you can sign. You will be considered late if you have to sign the sheet instead of using your clicker to register your attendance. If you forget to bring your Top Hat device to class or you can’t get it to work that day, you can be considered present only if you inform Dr. Maxwell of your presence while roll is being taken. This only applies to students who have already registered on Top Hat. If you haven’t registered on Top Hat by Sept. 5, you will be counted absent. **Important Note:** In order to get credit for Top Hat activities, you must sign up for Top Hat with the same last name that is in the Ramport system! If you use a different last name than the official one, Dr. Maxwell cannot give you credit. Attendance will be part of the participation/CPS grade that is worth 100 points total out of 1350 points. Missing class will lower your attendance grade significantly, so you must attend class if you expect to pass this course.

Enforcement of Attendance Policy:

Each class period Dr. Maxwell will spot check the attendance of 10-15 random students, probably during one of our short breaks. After class is over, Dr. Maxwell will check the CPS log and the late sign-in sheet to make sure that any student found missing in the spot check did not have a classmate use his or her clicker to register his or her attendance fraudulently. Any student who leaves the class early must go down to the front door and sign out. Leaving early may or may not count as a late or absence, and is up to Dr. Maxwell’s discretion, depending mainly on how much class time is missed. **Any student who is found to have registered his or her attendance fraudulently will be accused of academic dishonesty and will automatically fail the course, even before the drop date!**

Blackboard:

Blackboard is a computer learning environment to help you with your studies. To log onto blackboard, type in [http://blackboard.angelo.edu](http://blackboard.angelo.edu) into your web browser. Then click the grey “Login” button to the left of the screen. Next type in your username and password. Your username and password are assigned by IT. Please see Dr. Maxwell if you have trouble logging onto Blackboard.

Classroom Performance System:

All students are required to enroll in the Top Hat classroom performance system at the beginning of the semester. You can use the app on your cell phone or other mobile device, or you can text your answers to the Top Hat phone number. Students must bring the device (cell phone, tablet, etc.) to every class period. We will use the Top Hat system to take attendance. We will also use the mobile device to respond to groups of multiple choice questions designed to enhance the learning experience in the course. Students will receive a participation grade partly based on attendance and partly for performance on the CPS questions based on participation, not on whether the responses are correct. **Missing class will lower your attendance grade significantly, so you must attend class if you expect to pass this course.** Missing Top Hat questions can only be made up at the instructor’s discretion if the student has a documented reason for missing class. The instructor reserves the right to deny the student the opportunity to make up missed CPS questions. Your mobile device will also be used to take quizzes. The best way to make sure to get credit for the CPS questions is
to attend class and to participate when the questions are asked. You will receive one or more emails at the beginning of the semester from Top Hat, prompting you to sign on and register in the system. If you follow the link in the email sent to you, you will automatically be enrolled in the right section of the course. **Important:** You must pay for your Top Hat Account before September 5 using the same last name as the one in the ASU computer system. That's the only way your real name gets entered into the system. If you have not paid for your subscription by September 5, you will not get credit for any activities that involve Top Hat until your subscription is paid.

**Top Hat Course Codes:**
Be sure to use the correct course code for your section!!!!

**Class that Meets Monday, Wednesday & Friday at 8:00 am:** 399985  
**Class that Meets Tuesday & Thursday at 8:00 am:** 422424

**Sapling Learning Homework System:**
Students will be provided with a list of assigned homework problems in the textbook from Chapters 1-8. There are two assignments for most of the chapters. These problems will be found in the Sapling Learning Online Homework System. Students will be graded on the completeness of the assignments. There will be no deduction for multiple attempts at problems. Students are expected to keep working all the homework problems until they have arrived at the correct answer. **Do not hit “give up and view solution”**! Students are expected to begin working on the homework for a particular problem set as soon as we begin talking about that material in the lecture or the lab. Due dates for homework assignments are listed in the chart below. **Important:** in order to get credit for your Sapling homework assignments, you **must** register for Sapling using the same last name as the one for you in the ASU Computer system. Click on the following link for instructions in how to enroll in Sapling Learning: [https://community.macmillan.com/docs/DOC-5972-sapling-learning-registering-for-courses](https://community.macmillan.com/docs/DOC-5972-sapling-learning-registering-for-courses)

**Late Homework Policy:**
The Sapling Learning Homework system can accept late homework assignments. **However, for each day that the homework is late, 25% of the score will be deducted.** After 4 days, no credit will be given for late assignments. The system computes the score if any deductions need to be made for late homework.

**Sapling Learning Homework Deadlines**

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Topics</th>
<th>Due by:</th>
<th>Time due</th>
<th>Worth</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1</td>
<td>Pure substances, mixtures, periodic table, metals, nonmetals, metalloids, Metric units and prefixes, metric to metric conversions, significant figures, scientific notation, percents, matter, density</td>
<td>Monday, Sept. 2</td>
<td>11:55 pm</td>
<td>8 pts</td>
<td>Complete after reading through Lab 1 and finishing Lab 2</td>
</tr>
<tr>
<td>Assignment</td>
<td>Topics</td>
<td>Due by:</td>
<td>Time due</td>
<td>Worth</td>
<td>Comments</td>
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</tr>
<tr>
<td>1-2</td>
<td>Temperature, energy, specific heat, physical states, precision vs. accuracy, dosage calculations, percent calculations in health science, physical and chemical changes, chemical reactions</td>
<td>Sunday, Sept. 8</td>
<td>11:55 pm</td>
<td>6 pts</td>
<td>Complete after Lab 3</td>
</tr>
<tr>
<td>2</td>
<td>Subatomic particles and their properties, atomic number, mass number, isotopes, atomic mass, Radioisotopes, types of radiation, biological effects of radiation, nuclear equations, radioactive decay, half-lives, medical applications for radioisotopes</td>
<td>Sunday, Sept. 15</td>
<td>11:55 pm</td>
<td>8 pts</td>
<td>Complete after Lab 4</td>
</tr>
<tr>
<td>3-1</td>
<td>Electron arrangements, the octet rule, ion formation, ionic compounds, naming ionic compounds and writing the formula of ionic compounds with representative element ions, transition element ions and polyatomic ions, the mole, Avogadro’s number, atoms to moles conversions, molar masses of compounds</td>
<td>Tuesday, Sept. 24</td>
<td>11:55 pm</td>
<td>10 pts</td>
<td>Complete after Lab 5</td>
</tr>
<tr>
<td>3-2</td>
<td>Covalent bonds, electron dot structures, Lewis structures, grams to moles conversions, grams to atoms or molecules conversions, molar masses of compounds, grams to molecules conversions, molecular geometry, electronegativity, polarity of bonds and molecules</td>
<td>Sunday, Sept. 29</td>
<td>11:55 pm</td>
<td>7 pts</td>
<td>Complete after Lab 6</td>
</tr>
<tr>
<td>4-1</td>
<td>Alkanes, skeletal structures, functional groups, families of organic compounds, fatty acids</td>
<td>Sunday, Oct. 6</td>
<td>11:55 pm</td>
<td>9 pts</td>
<td>Complete after Lab 7</td>
</tr>
<tr>
<td>4-2</td>
<td>Nomenclature of alkanes, constitutional isomers, cis-trans isomers, unsaturated fatty acids, enantiomers, chiral molecules in biochemistry</td>
<td>Sunday, Oct. 13</td>
<td>11:55 pm</td>
<td>5 pts</td>
<td>Complete after Lab 8</td>
</tr>
<tr>
<td>5</td>
<td>Exothermic/endothermic reactions, change in enthalpy, entropy and free energy, activation energy, energy content in food, rates of chemical reactions, types of chemical reactions, reversible and irreversible reactions, combustion, alkanes, glycolysis, redox reactions reactions, condensation and hydrolysis reactions, addition reactions.</td>
<td>Tuesday, Oct. 22</td>
<td>11:55 pm</td>
<td>9 pts</td>
<td>Complete after Lab 9</td>
</tr>
<tr>
<td>Assignment</td>
<td>Topics</td>
<td>Due by:</td>
<td>Time due</td>
<td>Worth</td>
<td>Comments</td>
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<tr>
<td>6-1</td>
<td>Classes of carbohydrates, aldoses vs. ketoses, structures of common monosaccharides, stereochemistry of monosaccharides, cyclic forms of monosaccharides, oxidation and reduction of monosaccharides</td>
<td>Sunday, Oct. 27</td>
<td>11:55 pm</td>
<td>8 pts</td>
<td>Complete after Lab 10</td>
</tr>
<tr>
<td>6-2</td>
<td>Hydrolysis of disaccharides, naming glycosidic linkages, labeling anomic, acetal and hemiacetal carbon atoms, structures of common disaccharides, reducing disaccharides, structures of storage and structural polysaccharides, ABO blood types</td>
<td>Sunday, Nov. 3</td>
<td>11:55 pm</td>
<td>5 pts</td>
<td>Complete after Lab 11</td>
</tr>
<tr>
<td>7-1</td>
<td>Polarity of organic molecules, types of attractive forces, pressure, Boyle’s Law, Charles’ Law</td>
<td>Tuesday, Nov. 12</td>
<td>11:55 pm</td>
<td>7 pts</td>
<td>Complete after Lab 12</td>
</tr>
<tr>
<td>7-2</td>
<td>Gay-Lussac’s law, combined gas law, phase changes, liquids, solids, solubility, amphipathic compounds, soap, dietary lipids, trans fats, phospholipids, cellular membranes</td>
<td>Sunday, Nov. 17</td>
<td>11:55 pm</td>
<td>8 pts</td>
<td>Complete after Lab 13</td>
</tr>
<tr>
<td>8-1</td>
<td>Solutions, colloids, suspensions, solubility vs. temperature for solids and gases, solubility vs. pressure for gases, strong electrolytes, weak electrolytes, nonelectrolytes, concentration, molarity, equivalents, milliequivalents per liter, percent concentration, ppm</td>
<td>Sunday, Dec. 1</td>
<td>11:55 pm</td>
<td>6 pts</td>
<td>Complete after Lab 14</td>
</tr>
<tr>
<td>8-2</td>
<td>Dilution, diffusion, osmosis, dialysis, passive diffusion, facilitated transport, active transport</td>
<td>Sunday, Dec. 8</td>
<td>11:55 pm</td>
<td>3 pts</td>
<td>Complete before the Final Exam</td>
</tr>
</tbody>
</table>

**Policy on Academic Dishonesty:**

Students are expected to work independently on quizzes, exams and lab reports. 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.
Cell phone policy:
In regular class sessions and during exams, all cell phones must be set to silent alert. Students are not allowed to use cell phones during exams and quizzes for any reason whatsoever.
Thank you for respecting the rights of your fellow classmates by turning off the ringer on your phone during class.

Exam Grades:
Exam grades will be posted on blackboard, usually within a few hours after the exam has been taken. The answers to the exam will be posted on Blackboard sometime during the week after the exam. The student can claim their paper exam copy in the class period following the exam. The student can then compare the grade on Blackboard to the number of questions missed so that he or she can make certain the exam was graded correctly. Please see Dr. Maxwell if there is a discrepancy between the grade posted on Blackboard and the number of questions missed according to the key.

Old Exam Copies:
During the exams, students are required to write their name on both their answer sheet and their paper copy of the exam. Before the beginning of the class period after an exam, Dr. Maxwell will place the paper exam copies in alphabetical order by last name at the front of the class. All paper copies not picked up within 14 days of the date of the exam will be destroyed. Student answer sheets from exams will be held by the instructor for one calendar year from the date of the exam. Student answer sheets cannot be claimed by the student. Paper copies of the final exam will be available for perusal by the student for one year from the date of the exam, but cannot be taken from Dr. Maxwell’s custody.

Make-up Exam Policy:
Students will only be allowed to take one make-up exam if there is an illness or emergency which is documented in writing. In order for a student to be eligible to take a make-up exam, the student must notify Dr. Maxwell before the exam is missed by telephone, voice mail or email. When a student returns to class after missing an exam, he or she must present a document such as a doctor’s note or funeral notice in order for Dr. Maxwell to give permission for a make-up exam. All make-up exams will be given on Friday, December 6 at 2:00 pm in Cav 100. Students will not be given a second chance for a make-up exam. Each student may take no more than one make-up exam for any reason whatsoever.

Lab Course:
Attendance in lab is a mandatory part of this course. We will do group activities, short lab procedures and study skills in lab. The point values for these activities can be found on the lab schedule on the last page of this syllabus. Note that almost all of the new material will be presented during the lab period and not in the lecture. Poor attendance in lab will be fatal to your grade!

Lab Reports:
Labs and Experiments will be carried out as group activities in lab. Each lab will be worth 25 points. Students are required to check their lab answers with the Instructor or Lab Assistant before leaving the lab that day. The lowest lab report will be dropped, but if you miss lab with a documented excuse, you must carry out the work in the lab at home since quizzes will be given over the lab material near the beginning of the following week. Note that you are directly responsible for learning all the material from the lab each
week. No make-up labs will be accepted for any reason since your lowest lab grade will automatically be dropped. Only students with documented excuses are allowed to drop one lab.

**Mandatory Laboratory Safety Training and Quiz:**

All students who have not done previously done so must take the Blackboard Laboratory safety training and quiz. To determine if you are required to take it or not, log onto Blackboard. If you see the Course “Lab Safety Training”, then you are required to take the training and quiz. If you don’t see that course, or if you already have a passing score on the exam, then you are exempt from the requirement. If you do see the course, click on “Lab Safety Training”. Under the left hand menu, choose “Get Started Here”. There are three sections: 1) Welcome to Lab Safety Training - There are your instructions. 2) Lab safety training - Click on “Lab Safety - Click here to begin” --This will download a Powerpoint slide show which will cover the safety training. 3) The lab safety quiz. You must score 90% or higher. **Students who are required to pass the Safety Quiz will not be allowed to attend lab without passing the quiz starting Tuesday, Sept. 3. **There will be no exceptions to this rule.

**Missing Lab Policy:**

Students will only be allowed to miss a lab if there is an illness, emergency or other schedule problem which is documented in writing. In order for a student to be eligible for a make-up lab, the student must notify Dr. Maxwell or the lab instructor before the lab is missed by telephone, voice mail or email. When a student returns to class after missing a lab, he or she must present a document such as a doctor’s note or funeral notice or coach’s note in order for the instructor to give permission to miss the lab. If you have a documented excuse, your missing lab grade will be dropped. Note: Students can only be excused from and drop one lab grade per semester.

**Group Activities in Lab:**

A critical part of the learning in lab will take place in group learning activities. Although the students will complete the work in groups, each student will turn in their individual sheets with their answers. Students who miss a lab early in the week are encouraged to attend a session that meets later in the week if space is available. No make-up labs will be accepted for any reason since one lab grade will automatically be dropped for students who have a documented excuse for missing lab one time.

**Study Skills/Planner:**

The last activity of the day in lab for weeks 2-11 in lab will be an introduction to study skills. The study skills worksheets are found on blackboard and you are responsible for printing them out and bringing them to lab the appropriate week. Each study skills worksheet will be worth 5 points, and students will be encouraged to discuss the study skills worksheet with their group members before each student turns in their individual papers. In order to get credit for your study skills worksheet each week, you must show the instructor your weekly planner for the next week with a list of scheduled times to study for this course, and hopefully for your other courses as well. Students who turn in their study skills sheet without showing the instructor their weekly planner will receive a zero on the study skills worksheet. Research has shown that students who plan and organize their study time are much more likely to succeed in a course than students who do not organize their time well. Planners can be paper or electronic. It is a good idea for you to read through all the worksheets at the beginning of the semester so that you can begin to implement these ideas as early as possible.
Lab Clean up:

Before a student can leave the lab at the end of the experiment, he or she must make sure that the bench area is clean, that all electrical equipment has been unplugged and all faucets turned off, and that no solids have been left in the sinks. In the common areas, all of the hoods and balances must be clean and all reagent bottles must be capped. If reagent bottles are found uncapped during or after the lab or if the common areas are found dirty or with things that are not supposed to be there at the end of the lab, then clean-up points will be deducted from the grades of all lab students in that section for that experiment. If a particular bench is found dirty or with things that are not supposed to be there, then clean-up points will be deducted from all the students using that bench. If the instructor can determine who is responsible for a particular mess, then the clean-up points will be deducted only from the grades of the student or students responsible. If not, then clean-up points will be deducted from all students in the section for messes in common areas and from all students on a particular bench for messes on that bench. No points will be deducted for broken glassware as long as it is cleaned up and reported to the instructor.
<table>
<thead>
<tr>
<th>Week</th>
<th>Dates: Class Meetings</th>
<th>Sections Covered</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aug. 26, 28 &amp; 30</td>
<td>Sections 1.1 - 1.3 No quiz</td>
<td>Pure substances, mixtures, periodic table, metals, nonmetals, metalloids, Metric units and prefixes, metric to metric conversions,</td>
</tr>
<tr>
<td>2</td>
<td>Sept. 4 &amp; 6 Holiday on Monday</td>
<td>Sections 1.4 - 1.6 Wednesday Sept. 4 – Quiz 1</td>
<td>Significant figures, scientific notation, percents, matter, density, temperature, energy, specific heat, physical states, precision vs. accuracy</td>
</tr>
<tr>
<td>3</td>
<td>Sept. 9, 11 &amp; 13</td>
<td>Sections 2.1 – 2.3 Sept. 9 – Quiz 2</td>
<td>Dosage calculations, percent calculations in health science, physical and chemical changes, chemical reactions</td>
</tr>
<tr>
<td>4</td>
<td>Sept. 16, 18 &amp; 20</td>
<td>Sections 2.4 – 2.7 Sept. 16 – Quiz 3</td>
<td>Atoms, subatomic particles, atomic number, mass number, isotopes, atomic mass Radioactivity, radioisotopes, nuclear equations, radioactive decay, radiations units and half-lives, medical applications for radioactivity</td>
</tr>
<tr>
<td>5</td>
<td>Sept. 23, 25 &amp; 27</td>
<td>Sections 3.1 – 3.3 &amp; parts of 3.5 Sept. 23 – Exam I (Chs 1 &amp; 2)</td>
<td>Electron arrangements, the octet rule, ion formation, ionic compounds, naming ionic compounds and writing the formula of ionic compounds with representative element ions, transition element ions and polyatomic ions, the mole, Avogadro’s number, atoms to moles conversions, molar masses of compounds</td>
</tr>
<tr>
<td>6</td>
<td>Sept 30, Oct. 2 &amp; 4</td>
<td>Sections 3.4 – 3.7 Sept. 30 – Quiz 4</td>
<td>Covalent bonds, electron dot structures, Lewis structures, grams to moles conversions, grams to atoms or molecules conversions, molar masses of compounds, grams to molecules conversions, Molecular geometry, electronegativity, polarity of bonds and molecules</td>
</tr>
<tr>
<td>7</td>
<td>Oct. 7, 9 &amp; 11</td>
<td>Sections 4.1 - 4.3 Oct. 7 – Quiz 5</td>
<td>alkanes, skeletal structures, functional groups, families of organic compounds, fatty acids</td>
</tr>
<tr>
<td>8</td>
<td>Oct. 14, 16 &amp; 18</td>
<td>Sections 4.4 - 4.5 Oct. 14 – Quiz 6</td>
<td>Nomenclature of alkanes, types of isomers in organic chemistry, unsaturated fatty acids, chiral molecules in biochemistry</td>
</tr>
<tr>
<td>9</td>
<td>Oct. 21, 23 &amp; 25</td>
<td>Chapter 5 Oct. 21 – Exam 2 (Chs 3 &amp; 4)</td>
<td>Heats of Reaction, exothermic and endothermic reactions, enthalpy change, entropy change, free energy, exergonic and endergonic reactions, spontaneous and nonspontaneous reactions, ATP, ADP, activation energy, energy content in food, rates of chemical reactions and the factors that affect them, catalysts, enzymes, types of chemical reactions (synthesis, decomposition and exchange reactions), reversible and irreversible reactions, combustion, alkanes, glycolysis, oxidation and reduction reactions, condensation and hydrolysis reactions, hydrolyzable and nonhydrolyzable, addition reactions (hydrogenation and hydration).</td>
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<tr>
<td>10</td>
<td>Oct. 28, 30 &amp; Nov. 1</td>
<td>Sections 6.1 - 6.4 <strong>Oct. 28 – Quiz 7</strong></td>
<td>Classes of carbohydrates, aldoses vs. ketoses, structures of common monosaccharides, stereochemistry of monosaccharides, cyclic forms of monosaccharides, oxidation and reduction of monosaccharides</td>
</tr>
<tr>
<td>11</td>
<td>Nov. 4, 6 &amp; 8</td>
<td>Sections 6.5 – 6.7 <strong>Nov. 4 – Quiz 8</strong></td>
<td>Hydrolysis of disaccharides, naming glycosidic linkages, labeling anomeric, acetal and hemiacetal carbon atoms, structures of common disaccharides, reducing disaccharides, structures of storage and structural polysaccharides, ABO blood types</td>
</tr>
<tr>
<td>12</td>
<td>Nov. 11, 13 &amp; 15</td>
<td>Sections 7.1 - 7.2 <strong>Nov. 11 – Exam 3 (Ch 5 &amp; 6)</strong></td>
<td>Polarity of organic molecules, types of attractive forces, pressure, Boyle’s Law, Charles’ Law</td>
</tr>
<tr>
<td>13</td>
<td>Nov 18, 20 &amp; 22</td>
<td>Sections 7.2 (cont) – 7.6 <strong>Nov. 18 – Quiz 9</strong></td>
<td>Gay-Lussac’s law, combined gas law, phase changes, liquids, solids, solubility, amphipathic compounds, soap, dietary lipids, trans fats, phospholipids, cellular membranes</td>
</tr>
<tr>
<td>14</td>
<td>Nov. 25</td>
<td>Sections 8.1-8.4 <strong>Nov. 25 – Quiz 10</strong></td>
<td>Solutions, colloids, suspensions, solubility vs. temperature for solids and gases, solubility vs. pressure for gases, strong electrolytes, weak electrolytes, nonelectrolytes, concentration, molarity, equivalents, milliequivalents per liter, percent concentration, ppm</td>
</tr>
<tr>
<td>15</td>
<td>Dec. 2, 4 &amp; 6</td>
<td>Sections 8.5 – 8.7 <strong>Dec. 2 – Quiz 11</strong></td>
<td>Dilution, diffusion, osmosis, dialysis, passive diffusion, facilitated transport, active transport</td>
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<tr>
<td>16</td>
<td>Dec. 9 8:00 am – Final Exam (Comprehensive)</td>
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</table>

The final exam for Section 010 will be held on Monday, December 9 at 8:00 – 10:00 am
<table>
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<tr>
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<th>Dates: Class Meetings</th>
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<tr>
<td>1</td>
<td>Aug. 27 &amp; 29</td>
<td>Sections 1.1 - 1.3 No quiz</td>
<td>Pure substances, mixtures, periodic table, metals, nonmetals, metalloids, Metric units and prefixes, metric to metric conversions,</td>
</tr>
<tr>
<td>2</td>
<td>Sept. 3 &amp; 5</td>
<td>Sections 1.4 - 1.6 Sept. 3 – Quiz 1</td>
<td>Significant figures, scientific notation, percents, matter, density, temperature, energy, specific heat, physical states, precision vs. accuracy</td>
</tr>
<tr>
<td>3</td>
<td>Sept. 10 &amp; 12</td>
<td>Sections 2.1 - 2.3 Sept. 10 – Quiz 2</td>
<td>Dosage calculations, percent calculations in health science, physical and chemical changes, chemical reactions</td>
</tr>
<tr>
<td>4</td>
<td>Sept. 17 &amp; 19</td>
<td>Sections 2.4 – 2.7 Sept. 17 – Quiz 3</td>
<td>Atoms, subatomic particles, atomic number, mass number, isotopes, atomic mass Radioactivity, radioisotopes, nuclear equations, radioactive decay, radiations units and half-lives, medical applications for radioactivity</td>
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<td>5</td>
<td>Sept. 24 &amp; 26</td>
<td>Sections 3.1 – 3.3 &amp; parts of 3.5 Sept. 24 – Exam I (Chs 1 &amp; 2)</td>
<td>Electron arrangements, the octet rule, ion formation, ionic compounds, naming ionic compounds and writing the formula of ionic compounds with representative element ions, transition element ions and polyatomic ions, the mole, Avogadro’s number, atoms to moles conversions, molar masses of compounds</td>
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<td>Oct. 1 &amp; 3</td>
<td>Sections 3.4 – 3.5 Oct. 1 – Quiz 4</td>
<td>Covalent bonds, electron dot structures, Lewis structures, grams to moles conversions, grams to atoms or molecules conversions, molar masses of compounds, grams to molecules conversions</td>
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<td>7</td>
<td>Oct. 8 &amp; 10</td>
<td>Sections 3.6 -3.7 &amp; 4.1 - 4.3 Oct. 8 – Quiz 5</td>
<td>Molecular geometry, electronegativity, polarity of bonds and molecules, alkanes, skeletal structures, functional groups, families of organic compounds, fatty acids</td>
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<td>8</td>
<td>Oct. 15 &amp; 17</td>
<td>Sections 4.4 - 4.5 Oct. 15 – Quiz 6</td>
<td>Nomenclature of alkanes, types of isomers in organic chemistry, unsaturated fatty acids, chiral molecules in biochemistry</td>
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<td>9</td>
<td>Oct. 22 &amp; 24</td>
<td>Chapter 5 Oct. 22 – Exam 2 (Chs 3 &amp; 4)</td>
<td>Heats of Reaction, exothermic and endothermic reactions, enthalpy change, entropy change, free energy, exergonic and endergonic reactions, spontaneous and nonspontaneous reactions, ATP, ADP, activation energy, energy content in food, rates of chemical reactions and the factors that affect them, catalysts, enzymes, types of chemical reactions (synthesis, decomposition and exchange reactions), reversible and irreversible reactions, combustion, alkanes, glycolysis, oxidation and reduction reactions, condensation and hydrolysis reactions, hydrolyzable and nonhydrolyzable, addition reactions (hydrogenation and hydration).</td>
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<td>Sections 6.1 - 6.4</td>
<td>Classes of carbohydrates, aldoses vs. ketoses, structures of common monosaccharides, stereochemistry of monosaccharides, cyclic forms of monosaccharides, oxidation and reduction of monosaccharides</td>
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<td>Nov. 5 &amp; 7</td>
<td>Sections 6.5 – 6.7</td>
<td>Hydrolysis of disaccharides, naming glycosidic linkages, labeling anomic, acetal and hemiacetal carbon atoms, structures of common disaccharides, reducing disaccharides, structures of storage and structural polysaccharides, ABO blood types</td>
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<td>Sections 7.1 - 7.2</td>
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<td><strong>Nov. 12 – Exam 3 (Ch 5 &amp; 6)</strong></td>
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<td>Nov. 19 &amp; 21</td>
<td>Sections 7.2 (cont) – 7.6</td>
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<td><strong>Nov. 19 – Quiz 9</strong></td>
<td></td>
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<tr>
<td>14</td>
<td>Nov. 26</td>
<td>Sections 8.1-8.4</td>
<td>Solutions, colloids, suspensions, solubility vs. temperature for solids and gases, solubility vs. pressure for gases, strong electrolytes, weak electrolytes, nonelectrolytes, concentration, molarity, equivalents, milliequivalents per liter, percent concentration, ppm</td>
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<td><strong>Nov. 26 – Quiz 10</strong></td>
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<tr>
<td>15</td>
<td>Dec. 3 &amp; 5</td>
<td>Sections 8.5 – 8.7</td>
<td>Dilution, diffusion, osmosis, dialysis, passive diffusion, facilitated transport, active transport</td>
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<td><strong>Dec. 3 – Quiz 11</strong></td>
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<tr>
<td>16</td>
<td>Dec. 10 8:00 am – Final Exam (Comprehensive)</td>
<td>The final exam for Section 020 will be held on Tuesday, December 10 at 8:00 – 10:00 am</td>
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<tr>
<td>Week</td>
<td>Dates: Week of</td>
<td>Lab</td>
<td>Study Skills Worksheet</td>
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</tr>
</tbody>
</table>
| 1    | Aug 26         | Lab Safety Presentation  
Lab 2: Properties, Units & Conversions (25 pts) | Study Skills Worksheet |
| 2    | Sept. 3        | Students will not be allowed in lab until the Lab Safety Course Quiz has been passed with a 90% or Better.  
Lab 3: Multistep Conversions, Dosage Calculations and Specific Heat (25 pts)  
No Lab on Monday. Monday lab students will complete this lab and turn it in on Sept. 9 | Study Skills Worksheet  
#1: Time Management/Show Instructor your Planner (5 pt)  
#2: Test Preparation (5 pts)  
Monday lab: Also do SS WS #1 today |
| 3    | Sept 9         | Lab 4: Atoms, Isotopes & Radiation (25 pts)  
Students who are pregnant or who may be pregnant will carry out this experiment in the library.  
Monday lab students (and all lab students) will not be allowed in lab until the Lab Safety Course Quiz has been passed with a 90% or Better. | Study Skills Worksheet  
#2: Test Preparation (5 pts)  
Monday lab: Also do SS WS #1 today |
| 4    | Sept 16        | Lab 5: Arrangement of e-, Ionic Compounds & Introduction to Moles & Covalent Compounds (25 pts) | Study Skills Worksheet  
#3: Motivation (5 pts) |
| 5    | Sept 23        | Lab 6: Covalent Compounds and Moles (25 pts) | Study Skills Worksheet  
#4: Distributed Practice (5 pts) |
#5: Learning and Memory (5 pts) |
| 7    | Oct 7          | Lab 8: Naming Branched Alkanes and Isomers (25 pts) | Study Skills Worksheet  
#6: Critical Thinking (5 pts) |
| 8    | Oct 14         | Lab 9: Chemical Reactions | Study Skills Worksheet  
#7: Note-Taking Techniques (5 pts) |
| 9    | Oct 21         | Lab 10: Intro to Carbohydrates: Monosaccharides (25 pts) | Study Skills Worksheet  
#8: Learning Styles (5 pts) |
| 10   | Oct 28         | Lab 11: Glycosidic Linkages, Disaccharides, and Polysaccharides (25 pts) | Study Skills Worksheet  
#9: Learning Styles  
Active Reading (5 pts) |
| 11   | Nov 4          | Lab 12: Attractive Forces & Gas Laws (25 pts) | Study Skills Worksheet  
#10: Visual Organizers (5 pts) |
<p>| 12   | Nov 11         | Lab 13: More Gas Laws, Physical States, Solubility, Dietary Lipids &amp; Cell Membranes (25 pts) | n/a |
| 13   | Nov 18         | Lab 14: Solutions, Solubility, Concentration (25 pts) | n/a |
| 14   | Nov 25         | No Lab This Week (Thanksgiving Holiday) | n/a |</p>
<table>
<thead>
<tr>
<th>Week</th>
<th>Dates: Week of</th>
<th>Experiment</th>
<th>Study Skills Worksheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Dec. 2</td>
<td>Lab 15: Dilution, Osmosis &amp; Membrane Transport (25 pts) <strong>Mandatory Attendance for All Students!</strong> – Only students who have a documented excuse can miss a Lab!</td>
<td>n/a</td>
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</tbody>
</table>