

Perimeter College at Georgia State University
Department of Physical Science: Dunwoody Campus
Chemistry1511-063 Fall 2019 Course Syllabus

Course Title: Survey of Chemistry I, MW 5:30 pm – 6:45pm Room NE-1440
Instructor: Dr. Jerry L. Poteat, Professor of Chemistry
Office: NE-2615, 770-274-5057, jpoteat@gsu.edu
Advising and Tutoring Hours: M 1:30pm– 5:00 pm T 4:00 pm - 5:00 pm W 4:15pm -5:15 pm
R 12:30 pm -3:00 pm

Required Text: General, Organic , and Biological Chemistry (*Structures of Life*) Timberlake , 6th Ed. Pearson

Course Description: Credit -3.0 hrs This is the first course in a two course sequence designed for physical education, business, humanities, social science, and allied health (Nursing or Dental Hygiene) majors planning to pursue baccalaureate degrees. Topics to be covered include elements, compounds, measurements, nomenclature, atomic bonding, states of matter, and molecular geometry. Laboratory exercises complement/supplement the lecture material.

Corequisite-1151L

Semester Schedule

Title	Chapter	Major Concepts and Skills
Chemistry in Our Lives Measurements	1,2	scientific method, measurement units and physical quantities, significant figures and uncertainty in measurements , precision versus accuracy of measurements , converting units, percent as a conversion factor, density ($d = m/v$)
Matter and Energy	3	heat energy, calculations with specific heat, temperature conversions, classifying matter, physical and chemical properties of matter, differentiating atoms, molecules, elements, compounds, mixtures, monoatomic ions, polyatomic ions, chemical symbols versus chemical formulas
Atoms and Elements (Weeks 1-4)	4	atomic structure, interpreting and using the periodic table to determine: the number of protons (p) and electrons (e^-) in an atom, to classify elements as metals or nonmetals, to determine the mass of elements and compounds, to determine the number of valence electrons for main groups elements, trends in the table based on table organization (<i>atomic radius, ionization energy</i>), writing electron configurations for elements, isotopes
Exam I (Chapters 1-4)		Date: 09.18.19
Ionic and Molecular Compounds	6	valence electrons and the Lewis symbol, octet rule, writing ionic compound formulas from the name and vice versa, naming polyatomic ions, writing and using Lewis structures to determine molecular geometry (<i>i.e. shape</i>) and then using geometry to determine polarity via the VSEPR theory, electronegativity, bond polarity versus molecular polarity, writing binary covalent compound formulas from the name and vice versa, the hydrogen bond
Chemical Reactions and Quantities (Weeks 5-7)	7	types of reactions, redox reactions and oxidation number, Avogadro’s number, grams to moles or moles to grams via molar mass, balancing equations, calculating the theoretical yield, endothermic versus exothermic reactions, activation energy, energy diagrams
Exam II (Chapters 6 and 7)		Date: 10.09.19

Solutions	9	electrolytes, factors affecting solubility and the solubility rules, Henry’s law, net ionic equations, solution concentrations (percent concentrations, molarity), preparation of dilute solutions and solutions of known concentrations , colloids, osmolarity, osmosis versus dialysis, isotonic, hypotonic, hypertonic
Reaction Rates and Chemical Equilibrium (Weeks 8-11)	10	reaction rate, collision theory , factors that affect reaction rate , catalysts, equilibrium constant versus equilibrium expressions, Le Chatelier's Principle
Exam III (Chapters 9 and 10)		Date: 11.06.19
Acids and Bases	11	acid-base theories, naming common acids and bases, conjugate acid-base pairs, acid strength (<i>Ka and pKa</i>), pH calculation and scale(0-14), salt hydrolysis, titration, buffers, Henderson-Hasselbalch equation,
Gases	8	properties of a gas, the kinetic molecular theory (KMT) and the three states of matter , gas laws (Boyle-Charles, combined gas law, the ideal gas equation (PV= nRT), Dalton’s law of partial pressure
Nuclear Chemistry (Weeks 12-14)	5	types of radiation (alpha, beta, positron, gamma), half-life, biological effects of radiation, diagnostic and therapeutic uses of radioisotopes (<i>Sections 5.1, and 5.3 thru 5.5</i>)
Exam IV (Chapters 11, 8, and Sections 5.1, and 5.3 thru 5.5)		Date: 12.04.19
Final Exam	1-10	Wed., 12.11.19 from 5:30 pm - 8:00 pm in Room NE-1440

*Dates for the semester exams are tentative and are subject to change to a later date .

Grading	Grading Scale
Assessment Events (1000 pts)	
Exams (4 x 160) - 640 pts	A = ≥ 900 pts
Problem Assignments (4) - 120 pts	B = ≥ 800 pts
Final Exam - 220 pts	C = ≥ 700 pts
	D = ≥ 600 pts
	F = ≤ 599 pts

There will be no make-ups for semester exams . If you miss an exam, then the percent you score on the final exam will be multiplied by 160 points to determine your grade for the missed exam.. For example, you score 80 out of 100 on the final. This is equal to 80%. Consequently, the score on the missed exam will be (0.8)(160) = 128 points.

The final exam will be the standard American Chemical Society(ACS) exam. . Questions from the ACS exam will have differences in the wording compared to those multiple-choice questions seen on Exams I-IV but the ACS exam questions will cover subject matter presented during the semester.

Important Dates:

Labor Day Holiday – Mon, 09.02.19 (*campus closed, no classes held*)

Faculty Development Day - TBA

Midpoint -Tuesday, 10.15.19 (<i>This is the last day to withdraw with a W</i>)

Thanksgiving Break – 11.25.19 – 12.01.19

Last Day of Class for this course —Mon., 12.09.19 (*Last day for all classes is also Monday 12.09.19*)

Final Exam, 5:30- pm – 8:00 pm, Wednesday, December 11, 2019 Room NE-1440

Fall 2019 Grades Due, 5:00 pm , Thurs, Dec. 19

Course Format

1. **This is a survey course but no course in chemistry is really a survey course.** Any course in chemistry will be difficult the first time through. This course is designed to give you a working knowledge of the fundamental concepts and applications in chemistry through lecture instruction. The topics in the lecture are also supported by lab instruction.
2. You must read the chapter or section being covered in lecture before coming to class. Also, be sure to clarify those concepts that may seem unclear to you as soon as possible after the lecture because that will be the question you will get wrong on an exam.
3. a. The recommended practice problems are designed to reinforce the concepts presented in the lecture and the text. . You must work a sufficient number of the recommended problems to do well on the exams, and the final exam. Thoroughness is key in doing these assignments even if the answer is wrong.
b. Recommended practice problems from the Timberlake textbook will be posted in a separate handout at the college course website. Some of these recommended practice problems may be on exams so it is recommended you work as many of these as possible in accordance with your workload.
4. Exam questions are designed to test your overall working knowledge of the material covered for that particular exam. They generally will consist of multiple choice, an essay question, one or more graph or table interpretation type questions, short answer questions, and problems requiring a calculator.
5. The Final Exam (ACS) is comprehensive covering all the material assessed on the four semester exams.

Entry Level Competencies

Upon entering this course the student is expected to be able to:

1. Place large and small numbers in exponential notation and use the rules for adding, subtracting, multiplying and dividing numbers with exponents.
2. Manipulate simple algebraic equations for problem solving.
3. Extract relevant information required to solve problems and identify the desired goal.

General Educational Outcomes

A. This course addresses the general education outcome relating to communication as follows:

1. Students develop their reading comprehension skills by reading the text and handout materials.
2. Students develop their learning skill through lecture and small group problem solving. Lecture material is presented that is not included in the text or handout material and is included as part of the exams or test.
3. Students develop their reading and writing skills through the use of problems and activities developed specifically to enhance their understanding of certain chemistry principles. Students provide written or oral solutions to these problems in both individual and group format. They must also contend with short-answer type questions on course exams.

B. This course addresses the general education outcome relating to demonstrating effective individual and group problem solving and critical thinking skills in variety of ways:

1. Students learn individual and group problem solving and critical thinking skills by doing problems both in the classroom settings during the lecture and outside of the classroom.
2. Critical thinking skills are encouraged in many ways, one of which is by requesting student response to questions asked during the lecture.

C. This addresses the general educational outcome relating to recognizing and applying scientific inquiry in a variety of settings as follows:

1. Students apply the scientific method in the set-up and solution of the problems designed to illustrate the chemical principles being taught.
2. Students use models that explain the basic scientific phenomenon and relate it to everyday situations.
3. Students use conceptual and physical models to explore theory and relate it to preexisting concepts.

Expected Educational Results

Upon successful completion of this course, the student should be able to:

1. Use the metric units and appropriate prefixes for mass, length, volume, temperature, density, specific gravity and calories, and convert between one unit and another, including English units.
2. Describe the subatomic particle composition of an atom and interpret atomic number and mass number, including isotopes; describe the electron distribution in the orbitals of an atom.
3. Use the periodic table as a tool to predict trends in chemical behavior, such as atomic radius, ionization energy, bonding.
4. For any given atom or molecule/ionic unit:
 - a. Predict the bond type.
 - b. Draw the Lewis Dot structure.
 - c. Determine the number of bonds formed by hydrogen and the row two elements.
 - d. Determine the polarity and geometry of the molecules using VSEPR theory.
 - e. Determine the relationship between polarity and physical properties of compounds.
 - f. Write the formula from the name of a compound and vice versa.
5. For chemical reactions:
 - a. Balance chemical equations.
 - b. Solve simple stoichiometry problems.
 - c. Identify energy changes that accompany a reaction.
 - d. Classify types of chemical reactions.
6. Use Kinetic Molecular Theory to explain disruptive forces (kinetic energy) and cohesive forces (intermolecular forces) of molecules/particles in relation to the three states of matter, with major emphasis on the gaseous state; state the molecular properties of solids, liquids and gases, and perform calculations using the Ideal Gas Law and Dalton's Law of Partial Pressures.
7. Describe solutions and colloids in qualitative terms and perform calculations related to concentration, dilution, and colligative properties.
8. State factors affecting rates of chemical reactions, interpret energy diagrams, use collision theory to explain rates of reactions, write and interpret the equilibrium constant expression for a given chemical reaction, use Le Chatelier's Principle to predict shifts in equilibrium.
9. For acids and bases:
 - a. Compare and contrast properties and definitions.
 - b. Calculate pH given the hydronium ion or hydroxide ion concentration of a solution and vice versa.
 - c. State the role of buffers and their mechanism in maintaining pH in body fluids.
 - d. Write the conjugate of a given acid or base, and relate acid or base strength to the strength of its conjugate.
 - e. Calculate pKa and relate it to the strength of an acid.
 - f. Perform calculations on an acid-base titration.
10. State the different types of radiation and describe how radiation is harmful to living tissue; describe the use of radioactive isotopes in medicine.

Course Content

TOPICS:

Matter, Measurements, and Calculations

Atoms and Molecules

Electronic Structure and the Periodic Law

Forces Between Particles

Chemical Reactions

Solutions and Colloids

Reaction Rates and Equilibrium

Acids and Bases

Simple Stoichiometry (excluding limiting reactant)

Gas Laws

Nuclear Chemistry

Class Policies

Attendance

Students are expected to attend every lecture session. You cannot expect to do well in this course if you don't attend class. Attendance will be taken each class period. It is your responsibility to make sure you are counted present if you arrive late to class. Partial absences are counted if you leave class early or arrive to class very late. Attendance is factored into the class performance grade because you cannot participate in class if you are absent. A student who has more four or more unapproved absences is subject to receiving an F in the course regardless of their course average. The student is responsible for all material covered and all announcements made in class. Absence from class does not relieve one of this responsibility.

Course Withdrawal

It is the responsibility of the student to withdraw from this course if they so decide. The instructor will not withdraw you for lack of attendance. A grade of W will be assigned on your transcript if you withdraw before the midpoint. A grade of WF will be assigned if you withdraw after the midpoint. A grade of WF is equivalent to an F. Students who stop attending class will be assigned a course grade based on the criteria given in the grading section of this syllabus. All missed exams will be assigned a grade of zero if the student does not take the final exam.

Students who have circumstances beyond their control may petition for a hardship withdrawal from the Dean of Academic Services. The eligibility requirement is a passing grade at the time the petition is requested. If a student drops the lecture, the laboratory course must be dropped and vice versa.

Exam Protocol

Students must bring a scantron, a No. 2 pencil, and a calculator when taking an exam in this course. Calculators may not be shared during an exam and it is the student's responsibility to bring one to the examination. Cell phones are not allowed to be used during exam sessions.

There are many different ways for a student who really wants to gain an unfair advantage on an exam to do so. However, the instructor can determine from experience when a student has cheated on an exam. A grade of zero will be assigned for any exam where the evidence is strong that cheating has occurred. A second offense of cheating will be addressed in accordance with the Perimeter College Academic Honesty Policy.

Classroom Conduct

How you conduct yourself during the lecture period is important to the overall success of the class and your success. Students who **consistently** display behavior that enhances the learning environment will earn the maximum number of points for their classroom performance grade. Students who **consistently** display behavior that is detrimental to the learning environment will receive zero points for their class performance grade. Examples of behavior that are disruptive to learning are: coming to class unprepared i.e., not reading the assignment or working the problems, arriving late to lecture, leaving early, irregular attendance, talking or whispering while the instructor or another student is speaking, sleeping, eating or drinking, cell phone ringing etc. Examples of behavior that are supportive for learning include being an active and attentive participant in the class by reading or working the appropriate sections and problems in the text before lecture.

Talking During Class and Cell Phones

This will be an interactive class, and students are encouraged to answer and ask questions. However, it is very distracting to the instructor, and especially to students seated near a student, when a student talks or whispers while the instructor or another student is speaking to the class. If you have a comment or question, please share it with the whole class by raising your hand and requesting permission to speak. Otherwise, please remain silent during class if it is not your turn to speak. A student who persists in talking out of turn or carrying on side conversations will be asked to leave the classroom.

Cell phones cannot be used while taking an exam in this course. Also, be sure to place your cell phone on vibrate or off while in class and to leave class if there is an emergency phone call.

Students are expected to abide by the class policies and procedures listed in this syllabus and to treat faculty and other students in a professional and respectful manner.

I prefer you send all correspondence related to the course using GSU email. I will normally reply within 24 hours during normal business hours, i.e. Monday through Thursday and the next business day if an email is sent on Friday from August 26, 2019 to December 09, 2019.

I prefer you schedule an appointment before you come to Advising and Tutoring Hours but an appointment is not required. When you come please have specific questions about the reading assignment, course assignments, or problems in the text.

Policy Statements

Attendance Policy

[1332.10 Dropping Classes and Voluntary Withdrawal \(Student Initiated\)](#)

[1332.30 Involuntary Withdrawal \(Faculty Initiated\)](#)

[Perimeter College Undergraduate Catalog Associate Level](#)

[Student Code of Conduct/Attendance](#)

Students are expected to attend classes in order to gain command of the concepts and materials of their courses of study. The specific class attendance policies for each class are at the discretion of the instructor, in accordance with the policies of the department and college.

All matters related to student absences, including making up work missed, are to be arranged between the student and the instructor before the semester begins or on the first week of classes. All instructors will, at the beginning of each semester, make a clear statement in the course syllabus for each of their classes, describing their policies for handling absences. Students are obligated to adhere to the requirements of each course and of each instructor. Instructors are encouraged to provide avenues for students to make up examinations and other work missed due to an excused absence.

Excused absences are recognized in the following cases: [University-Sponsored Events, Legal Obligations, Religious Observances, Class Attendance by Veterans](#)

In addition, it is suggested that the faculty give due consideration to absences relating to the following events:

- a. Death or major illness in student's [immediate family](#)
- b. Illness of a dependent family member
- c. Illness that is too severe or contagious for students to attend class

[Definition Immediate Family](#) – An immediate family member means spouse, parent, or child in accordance with the definition used for GSU employees.

Class Withdrawal

Students are responsible for formally dropping or withdrawing from courses using the online registration system, PAWS at paws.gsu.edu. Students should not simply stop attending. Students should be aware of the financial and academic consequences of dropping and withdrawing from courses. Three withdrawals are allowed during the Perimeter career after which withdrawals will be recorded as WF.

Learning and Tutoring Center

The LTC offers free, walk-in tutoring and academic support at five Perimeter College campuses. The LTC provides a variety of other resources and services to accommodate student needs. All LTCs are equipped with computers, instructional software and internet access. Please visit the LTC's website (i.e. success.students.gsu.edu/ltc) to find information about locations, hours of operation, tutoring and workshop schedules, handouts, online tutoring and links to online practice resources.

Academic Honesty Policy- Cheating and Plagiarism

Cheating includes any attempt to defraud, deceive or mislead the instructor in arriving at an honest grade assessment. Plagiarism is a form of cheating that involves presenting as one's own the ideas or work of another. All portions of any test, project or final exam submitted by you for a grade must be your own work unless you are instructed to work collaboratively. Specific requirements will be described for collaborative projects, but all work presented must be the work of members of that group. Research materials used must be properly cited. Violation of the Academic Honesty Policy will result in a grade of zero for that test, project or exam. The second offense will result in assignment of a grade of "F" for the course and a formal charge of Academic Dishonesty will be lodged with the Campus Dean for Student Services. Policies have been established by Perimeter College to ensure due process in charges of cheating or plagiarism. A copy of these procedures can be found in the Student Handbook.

Americans With Disabilities Act Statement

If you are a student who is disabled as defined under the Americans with Disabilities Act and require assistance or support services must request accommodation for a disability by registering with the Center for Disability Services (CDS). Students may only be accommodated upon issuance by the Center for Disability Services of a signed Accommodation Plan and are responsible for providing a copy of that plan to instructors of all classes in which accommodations are sought. A CDS Counselor will coordinate those services.

Statement of Non-Discrimination

Perimeter College supports the Civil Rights Act of 1964, Executive Order# 1 1246, Title IX of the Educational Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, and the Americans with Disabilities Act. No person shall, on the basis of age, race, religion, color, gender, sexual orientation, national origin or disability, be excluded from participation in, or be denied the benefits of, or be subjected to discrimination under any program or activity of the college. Any individual with a grievance related to the enforcement of any of the above provisions should contact the Assistant Director of Human Resources, Ombudsperson.

Affirmative Action Statement

Perimeter College adheres to affirmative action policies designed to promote diversity and equal opportunity for all faculty and students.

Veterans and Serving Military

Perimeter College honors its military and veteran men and women returning to pursue their educational goals. A Military Outreach Center is provided for them on the ground floor of Building H on the Clarkston Campus. Veterans, serving military, their dependents, and the survivors of serving military who are attending college are encouraged to avail themselves of a full range of college services and activities through the MOC. MOC resource tables are also located on all campuses to provide them with valuable information. The Center maintains a Military Outreach website at [http://depts.Perimeter College.edu/military outreach/](http://depts.PerimeterCollege.edu/military%20outreach/) and their telephone number is 678-891-3025. The Perimeter College Military Outreach Center is also looking forward to offering "Military Awareness Training"

to all faculty members next semester. This training is being designed to offer you the resources you will need to better assist our growing Veteran population here at Perimeter College. Thank you in advance for participating in this timely and valuable training!

Tobacco and Smoking on Campus Statement

Georgia State University (“Georgia State”) is committed to providing a clean, healthy, and comfortable environment for all students, faculty, staff and visitors. The use of tobacco products is prohibited on all property owned, leased or used by Georgia State, including but not limited to all internal and external areas; parking garages and parking lots; and in Georgia State owned and/or leased vehicles. Such use is also prohibited within 25 feet of all Georgia State building entrances and exits.

Miscellaneous Policies

Perimeter College seeks to provide an environment that is free of bias, discrimination, and harassment. If you have been the victim of sexual harassment/misconduct/assault, we encourage you to report this. If you report this to a faculty member, he or she must notify one of our college's Assistant Title IX Coordinators / Student Deans about the basic facts of the incident (you may choose whether you or anyone involved is identified by name). For more information please refer to our sexual misconduct website –

<http://depts.gpc.edu/gpcmiscconduct/index.html> .

Your constructive assessment of this course plays an indispensable role in shaping education at Georgia State University at Perimeter College. Upon completing the course, please take the time to fill out the online course evaluation.

This course syllabus provides a general plan for the course; deviations may be necessary.