

San José State University
College of Science/Department of Chemistry
Chem 1A General Chemistry Sec. 3 Fall 2019

Course and Contact Information

Instructor:	Elizabeth Migicovsky, PhD
Office Location:	DH 605
Email:	via canvas
Telephone:	Email is preferred
Office Hours:	MW 2:30 PM – 3:30 PM (and by appointment)
Class Days/Time:	MWF 1:30 PM – 2:20 PM
Classroom:	SCI –142
Prerequisites:	Proficiency in high school chemistry or CHEM 010 (with a grade of "C" or better; "C-" not accepted) or instructor consent; proficiency in high school algebra and eligibility for MATH 019; Writing Enrollment Group W-I or W-II, or ENGL 1AF with a grade of CR, or ENGL 1A with a grade of C- or better.

Please check your canvas periodically as handouts/online quizzes will be uploaded or emailed via Canvas.

COURSE FORMAT

This course has a lab and seminar component, which complement lectures. Lab exams/quizzes will be administered in seminars. Lecture quizzes will be taken online via canvas.

COURSE DESCRIPTION

Topics including stoichiometry, reactions, atomic structure, periodicity, bonding, states of matter, energy changes, solutions using organic and inorganic examples. Lab program complements lecture. Prerequisite: Proficiency in high school chemistry or CHEM 010 (with a grade of "C" or better; "C-" not accepted) or instructor consent; proficiency in high school algebra and eligibility for MATH 019; EPT requirement met. Misc/Lab: Lecture 3 hours/lecture 1 hour/lab 3 hours.

BS/BA CHEM PROGRAM LEARNING OUTCOMES (Covered by Chem 1A)

Chem 1A provides basic, introductory support for the following degree outcomes:

PLO #1 - Demonstrate understanding of core concepts and to effectively solve problems in inorganic chemistry.

PLO #2 - Demonstrate understanding of core concepts and to effectively solve problems in organic chemistry.

PLO #3 - Demonstrate understanding of core concepts and to effectively solve problems in analytical chemistry.

PLO #4 - Demonstrate understanding of core concepts and to effectively solve problems in physical chemistry.

PLO #5 - Demonstrate understanding of core concepts and to effectively solve problems in biochemistry.

PLO #6 - Answer questions regarding safe practices in the laboratory and chemical safety.

PLO #7 - Demonstrate safe laboratory skills (including proper handling of materials and chemical waste) for particular laboratory experiments.

COURSE LEARNING OUTCOMES

The detailed learning outcomes can be found at the end of this syllabus.

BOOKS/SUPPLIES/COURSES

Required

- 1) Chemistry: The Central Science – Brown, LeMay and Bursten – 10th, 11th or 12th edition (Or a college level Chem. text if you feel comfortable with a different textbook.)
- 2) **Lab Manual for Chemistry 1A** - Sold during the first 2 weeks of school by the Chemistry Student Club (DH20) - They only take cash!
- 3) **Chem. 1A Booklet** - Sold by the Chemistry Student Club (DH20). Contains sample exams, problems with solutions, abbreviated class notes, etc.
- 4) Hand-held scientific calculator - **Must be non-programmable** and should have log x, 10^x, ln x, e^x and x^y keys. - **You will not be allowed to use your programmable calculator or your cell phone during a lecture or lab exam, or quiz!**

Recommended

- 1) **Academic Excellence Workshops** to help you study for Chem. 1A. These are 3 hour a week organized study sessions. We will have 4 to 12 different sessions facilitated by former 1A students. I strongly encourage you to enroll in one of these workshops. More information will be provided in lecture on how to enroll.
- 2) Other Chemistry texts - Most freshman chemistry books are about the same in quality and content, however you might find another author's "prose" and text layout more to your liking. You can check out additional textbooks from King Library.
- 3) Solutions manuals to textbook problems - These options are available with your book.

Thing you must do the first week of class

- 1) Attend your lab section to claim your space. **Miss your first lab, we drop you from the course!**
- 2) Attend your seminars starting from the first Friday or lose points! Quizzes and lab discussion!
- 3) **Read this greensheet thoroughly.** It is the rules of the game. Best to know the rules before you start.
- 4) Read pages i – viii of the lab manual before attending your lab session.
- 5) Review significant figures/units/atomic and molecular weights in the booklet. Do the practice problems. We won't be going over this in class. This is review from high school or Chem. 10!
- 6) If you decide to drop the course, please give Dr. Singmaster a note with your name indicating that you will be dropping the course. It will allow us to add people efficiently.
- 7) Memorize your ions! List is in the Chem Booklet. Need to know them by end of second week of school...
- 8) Turn off your cell phone and/or pager, unless you have a family member with a serious medical condition (critical care, spouse in 9th month of pregnancy, etc.) or you are a fire fighter/police officer/FBI agent....
- 9) If you are trying to add you must attend one lab section and one seminar section a week until we add you. Please note the only person that can add you to the course is Dr. Singmaster. The lab and seminar instructors do not have codes, nor can they save you a space. Adds will be done in order of priority. The adds will be announced in lecture and the list posted in the glass cabinets across from DH17. If you are offered a space, you must claim your space in writing within 24 hours by placing a note with your name, SJSU ID number and a statement indicating that you accept in Dr. Singmaster's IN BOX on the door to DH16. Once we have that information, we will provide you with a permission number to add the lecture, lab and seminar.

PREREQUISITES/COREQUISITES

The prerequisites for Chem. 1A are completion of a one year high school chemistry course; Math 19 (Pre-calculus) and English 1A eligibility. You cannot be a remedial student. You need to recall your high school chemistry. **You should**

not enroll in Chem 1A if you have not had high school chemistry, if you can't remember your high school chemistry or if you had a weak high school chemistry! You should take the Chem 30A.

Every student who wishes to remain in the course or who wishes to add the course must be present in lab and seminar for the safety discussion and must take and pass a safety quiz. If you are waiting to get into the class please make certain you attend the safety discussion and take the safety quiz. You must pass the safety quiz with a score of 8 or better!

COURSE REQUIREMENTS AND ASSIGNMENTS

Lecture Exams and Final

Three fifty-minute exams (100 points each) will be given. Scheduled dates for the exams are attached. Plan ahead. The final exam (200 points) will be 2 hours long; it is a comprehensive multiple-choice exam. This course builds on itself so material covered on a previous lecture exam is needed in a following exam. The course lecturer reserves the right to give both in class quizzes and take home quizzes. There will be no make-ups for lecture exams. Should you miss an exam because of illness or equally compelling reasons, you should inform me of the fact as soon as possible, and hopefully before the exam is given. You can do so by emailing me. You will need to provide me with written evidence (doctors' note, police report, etc.) for your excuse. If I accept your excuse, I will use the score on the final (questions pertaining to the particular exam) as your exam score. An unexplained or unsatisfactory excuse for missing a lab or exam will result in a grade of zero. You can arrange to take the exam a day early if you have a planned, excused absence for the exam day.

You will need to bring your photo ID card, a #2 pencil, and a non-programmable calculator. Handouts and scratch paper will be distributed.

In-Class Exam Dates (Closed book; No notes permitted)

Exam 1: Friday, September 27 Exam 2: Wednesday, October 30 Exam 3: Friday, November 25

Final Exam: Friday, December 13th 12:15 PM - 2:30 PM

Lecture Quizzes

Several take-home quizzes will be given. Take-home quizzes must be submitted on assigned due dates, or they will not be accepted. **No make-ups for missed quizzes. Do not miss the due dates!** The quizzes will be posted on your Chem 1A Lab Canvas account, and you will need to finish them online before the due dates. More information will be given in lecture meetings before the due dates.

Once you submit your quiz on canvas, you cannot access it again so make sure you print a hard copy of the quiz for your reference. The quizzes will help you prepare for the exams.

Laboratory

The total lab grade constitutes 35% of the final grade. **Failing lab (55.0% or less) or lack of attendance to lab will result in an F grade for the FULL COURSE, irrelevant of how well you are doing in lecture.** Do not miss labs!! Details regarding the lab grade will be provided in lab greensheet.

GRADING INFORMATION

Lecture Grading

Final - 200 pts (23.6% of total course grade)

Three lecture exams - 100 pts (11.8 % of total grade for EACH test)

Canvas Quizzes - 50 pts (5.9% of total grade)

Lab/Seminar – 35% of total course grade – Details provided with lab/seminar bluesheet.

Your grades for all the lecture exams and canvas quizzes will be posted on canvas. You have only 9 days from the day a grade is posted to ask for a regrade. I will not do regrades after nine days have passed.

Grading Scale

At the end of the semester you will receive a single grade for the course. The following grade scale is for the full course, including lab.

above 97.0 % A+	79.9 - 77.0 % B-	56.9 - 54.0 % D
96.9 - 92.0 % A	76.9 - 72.0 % C+	52.9 - 50.0 % D-
91.9 - 89.0 % A-	71.9 - 65.0 % C	Below 50.0% F
88.9 - 85.0 % B+	64.9 - 61.0 % C-	
84.9 - 80.0 % B	60.9 - 57.0 % D+	

Incompletes will not be given unless a strong compelling reason with proof is furnished to support the need for an incomplete. Incompletes will not be granted just because the university won't late drop you or because the low grade will disqualify you, put you on probation or increase your car insurance payment! Incompletes do not remove past scores in exams! Incompletes are only given to persons who have completed at least 80% of the course. Incompletes are removed by completing pending tasks. I do not provide special projects to make up incompletes.

PLEASE note we DO NOT provide extra credit work at the end of the semester for students who are doing poorly. You need to perform well in your tests, lab reports and quizzes.

PLEASE note that I provide bonus points throughout the tests/quizzes to push your grade up a bit just in case you feel some grading was harsh or uneven. This can amount to as much as an extra 2%. At the end of the semester I decide letter grades using the scale above without providing additional bonus.

CLASSROOM PROTOCOL

Attendance/workload

Regular attendance to lecture, seminar and lab is required. Lecture material will not necessarily reiterate text material. It is a serious mistake either to depend on a classmate's notes or exclusively on the textbook. It is essential to keep up with class work, homework and laboratories to succeed in this course. The instructor is not responsible for covering material you missed due to unexcused absences. I do not give xeroxed copies of my notes if you are absent. **Absences to lab can and will result in an F grade for the FULL course** (two unexcused absences from lab are sufficient for me to drop or fail you!!). Please remember that missing lecture or lab to study for another class is not an acceptable excuse. You signed up for your course load, you are now responsible for fulfilling the obligations that come with that course load.

Please remember this is a 5 unit course, it will require a great deal of your time. Seldom does a student who works and carries a full course load succeed in this class. Make arrangements now; don't wait until you are behind. **The university guidelines are three hours of study time per unit per week.**

Please email me if you are going to be absent from lab for a legitimate reason. **ONE excused lab absence can be made up by attending another section and completing the work within the same week of the absence.** You will need the consent of the section's lab instructor. They are not required to accept you in their lab, particularly if their lab is full! I strongly encourage you to not be absent from lab.

Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally 3 hours per unit per week with 1 of the hours used for lecture) for instruction of preparation/studying or course related activities including but not limited to internships, labs, clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.

Misconduct

Students are to do only those laboratory experiments assigned. Certain chemicals when improperly used are very dangerous. You are responsible for disposing chemical wastes safely; the lab instructor will inform you on particular waste disposal issues for each experiment. If they forget to inform you, **ASK THEM!!** Any student found preparing anything that may in any way endanger her/his safety or the safety of others will be immediately dropped from the course with an F grade. Any student found disposing of wastes incorrectly is also in danger of being dropped from the course or failed. Students are expected to behave maturely and honorably in the lab and lecture course.

While taking exams or quizzes, the student should keep their eyes down on their own paper. No whispering or talking

is allowed. You are not allowed to share a calculator or periodic table during exams or quizzes. If your calculator fails inform the instructor. They can then decide a course of action. No cell phones or tablets are allowed. No headphones or devices in ears unless they are prescribed hearing aids. All printed or written material (notebooks, textbooks, etc.) should be placed under the seat, left outside the room or placed near the lecturer's table, at the front of the room. Failure to comply will cause the instructor to pick up the exam and give a grade of F for the exam and/or course. Willful solicitation, procurement or conveyance of exams/quizzes/unknowns will also result in failure of the course. The instructor can and will bring the person caught cheating to the attention of the university committee in charge of student misconduct.

Emergencies/evacuations

If you hear a continuously sounding alarm or are told to evacuate by Emergency Coordinators (colored badge identities), walk quickly to the nearest stairway (end of each hall). Take your personal belongings with you as you may not be immediately allowed to return. Follow instructions of Coordinators. Be quiet so you can hear. Once outside, move away from the building. Do not return to the building unless the Police or Coordinators announce that it is permissible. If an alarm should occur during an exam or quiz, please attempt to give your instructor the paper.

Safe and Respectful Community

We hope that the classroom and laboratory will serve as an environment that will promote learning and the development of new ideas, as well as be a safe and respectful community. Behavior that interferes with the normal academic function in a classroom or lab is unacceptable. Students exhibiting this behavior will be asked to leave the class. Examples of such behavior include

- a) Persistent interruptions or using disrespectful adjectives in response to the comments of others.
- b) The use of obscene or profane language.
- c) Yelling at classmates and/or faculty.
- d) Persistent and disruptive late arrival to or early departure from class without permission.
- e) Physical threats, harassing/bullying behavior, or personal insults (even when stated in a joking manner).
- f) Use of personal electronic devices such as pagers, cell phones, PDAs in class, unless it is part of the instructional activity.

UNIVERSITY POLICIES

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' [Syllabus Information web page](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/>

MISCELLANEOUS

- 1) You must bring the lab manual to each lab class; you must bring the booklet of handouts to lecture; however you do not need to bring the textbook to lecture.
- 2) Safety glasses must be worn at all times during the lab experiments; if they fog up, take them off outside the room!! SJSU provides you with goggles in your lab drawer but you might consider buying your own at the bookstore. Sometimes the student chemistry club sells them.
- 3) Keep track of your scores. Keep your reports, quizzes, etc. At the end of the semester compare your grade sheet with the lecturer and lab instructor's grade sheets to make sure we have transcribed and adjusted you grades correctly. **You have only 9 days from the day a quiz or exam is posted to ask for a regrade of your exam or quiz. I will not do regrades after nine days have passed. I do not return the lecture exams.**
- 4) Do not believe any sign written on the board saying the Chem. 1A class is canceled. Students in lecture are expected to wait for the instructor 15 min after the start of the class time. If I am late, but get to class by or before that time, I will lecture.
- 5) Each exam in lecture will require that you sign a statement indicating that you have behaved in an honorable manner while taking the exam. This means that you have not used crib sheets, programmed equations, etc. in your calculator, requested information from a classmate, etc. The statement will also indicate that you are not aware of any other classmate cheating, etc. during the course of the exam. Although you might not be required to sign such a pledge in your lab quizzes, honorable behavior is still expected. Please be aware that you have classmates that do not tolerate cheating and will most likely inform the instructor if they observe such behavior. If you feel that you are unable to sign such a pledge, talk to me.

- 6) **If a fire alarm were to interrupt an exam please do the following: Leave the room via the door closest to the instructor and give the instructor your quiz or exam. Provide assistance to any disabled students. Take your books with you since there is some chance you might need to go to your next class before you are allowed in the room.** Please note that if the cause of evacuation is a bomb threat, the Dean will request that I give him and UPD a list of students absent from the exam.
- 7) Please remember that you must check out of the lab even if you drop the course. A \$25 charge will be billed to you if you do not check out.
- 8) You will be a locker with another student in a different section. Please do not leave any valuables in the locker. Leave the locker clean and without stored chemicals for the next student. We will financially penalize students who consistently leave the lockers dirty for the next student. Consider getting your own personal safety goggles or glasses, and do not leave them in the locker.

Office Hours

My office is located in Duncan Hall Room 605. Your exam and quiz grades will be posted on your canvas account. Please be efficient and organized when you come to ask questions during office hours. I might have to limit the amount of time I spend with you if there are several students waiting.

On occasions, I will have to cancel office hours due to medical appointments or important committee meetings. I'm sorry for the inconvenience. Please see if you can get assistance from one of the lab or seminar instructors.

Lectures/lab buddies

In a difficult and time-consuming class such as this one, it is often very useful to establish a buddy relationship with one or two students. You can lend each other notes, study together, collect handouts for each other and commiserate with each other. Seriously consider establishing such a relationship with someone in lecture and in your lab (doesn't have to be the same person).

Resources for help

- 1) Dr. Migicovsky (Lab and Lecture)
- 2) Seminar instructors (Lab and, to some degree, lecture also)
- 3) Lab instructors (Lab predominantly, although some can also provide excellent help for lecture)
- 4) Academic Excellence Workshops (Lecture) – You must be enrolled! **Please note these are not tutoring sessions.** They are organized, collaborative study times.
- 5) *COSAC* – The College of Science Advising Center is located in the second Floor of Duncan Hall, DH 213. They have peer advisors and tutors. Check their schedule.
- 6) *Peer Connections* – They have small group, individual, and drop-in tutoring for a number of undergraduate courses, consultation with mentors is available on a drop-in or by appointment basis. Visit Peer Connections website at <http://peerconnections.sjsu.edu> for more information.
- 7) *ASPIRE* – Student Services Center – Services are limited to low income, first generation college students or students with disabilities.
- 8) *Counseling Services* - Professional psychologists, social workers, and counselors are available to provide consultations on issues of student mental health, campus climate or psychological and academic issues on an individual, couple, or group basis. To schedule an appointment or learn more information, visit Counseling Services website at <http://www.sjsu.edu/counseling>.
- 9) Private tutors – Cost \$\$\$. You might find ads in SAACS and in the hallways where Chemistry courses are taught (5th floor of DH, 1st floor of Sci) or you can post your ad in that room.
- 10) *Career Center*: <http://www.sjsu.edu/careercenter/>
- 11) *Accessible Education Center*. If you feel that you are unable to keep up with the class even though you have all the prerequisites; if you are spending ample time studying yet you never have time to finish exams and quizzes and/or if this class, for some reason, is testing your abilities to learn, you might consider paying a visit to the Accessible Education Center, ADM 110. They might be able to test you to determine whether you have a learning disability.

Rules for an exam in lecture

- 1) No sitting on the floor in the back of the lecture hall or on the stairs!
- 2) No programmable calculators, tablets, or cell phones. No sharing of calculators.
- 3) No smartwatches

- 4) No caps, hats, etc. unless required by a physician. Then they need to be turned around.
- 5) No head phones or other devices in ears unless they are prescribed hearing aids!
- 6) Ask for scratch paper. Do not pull it from your backpack..
- 7) Place backpacks under your seat so as to make sure that others don't trip trying to get out. No open books, notes, etc. on the floor at your feet!
- 8) No talking during an exam, even if you have handed in your exam. Wait until you leave the room.
- 9) Leave by the door at the base of the room that we will open, not the back door, so that I can keep track of who is leaving and whether they have handed in the exam.
- 10) You want to circle your choice on the exam as well as marking it on the Scantron. I return the exams, but I do not return the Scantrons!
- 11) **You must hand in your Scantron, your exam and all scratch paper. All the "Student Information" portion on the first page of the exam must be filled out!** The instructions will look like:

INSTRUCTIONS:

- a) Please write fill out the Student Information above.
- b) Please write your name and the course ID number on your Scantron.
- c) Please write the exam number on your Scantron.
- d) You can write on the exam, but please remember to record your choice on the Scantron. You must hand in the Scantron, this exam and all scratch paper if you want your exam graded. Please circle your choice on the exam also.
- e) Sign the honor pledge below.

_____ Signature ascertaining that you have behaved
honorably while taking this exam.

Syllabus for Chem. 1A – Dr. Migicovsky

TOPIC	CHAPTER	Lab
Independent Study of Units, Significant Figures, Dimensional Analysis, Density, Temp., Atomic and Molec. Weight	1, 2.4, 3.3	#1
Mole, % comp., empirical	3.4 - 3.5, booklet	#2
Nomenclature	2.5 – 2.8, booklet	
Solubility/Dissociation Rules	4.1 – 4.2, booklet	#3, 4
Net Ionic Equations	4.2- 4.3, booklet	#3, 4
Chemical Reactions	4.4, 20.1 – 20.2, booklet	#3, 4, 5
Stoichiometry	3.6 – 3.7, booklet	#6
Concentration and solution stoichiometry	4.5 – 4.6	#6
Structure of Atoms	2.1 – 2.4, Chap. 6	#7
Periodicity	7.1 – 7.6, booklet	#8
Bonding	Chap. 8	#9
Molecular Structure	9.1 – 9.6, booklet	#9
Gases	Chap.10, booklet	#10
Liquids and Solids	Chap.11, 23.5 - 23.6, booklet	#11
Heat Transfer and Thermochemistry	11.4, Chap. 5, booklet	#12
Organic Chemistry	2.9, 25.1 – 25.6	

Grade Record for Chem. 1A Students

Lecture (65% of grade)	Lab (35% of grade) (You must pass the lab with 55% or better to pass the course!)	
Exam I _____/100	Lab Exam I _____/100	Reports _____/
Exam II _____/100	Lab Exam II _____/100	_____/
Exam III _____/100		_____/
	Quizzes _____/10	_____/
	_____/10	_____/
Quizzes _____/	_____/10	_____/
_____/	_____/10	_____/
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_____/	_____/10	_____/

Chem 1A Course Learning Outcomes

Dr. Migicovsky's Lectures

This is a list of very specific learning outcomes for Chem 1A lecture. The lab will also provide hands-on opportunities to develop and apply this knowledge. If a specific outcome is also partially addressed with an experiment, we have included the experiment number in parenthesis. Please note that for many of the topics in this course real world examples are used. Also, on occasion, the topics result in brief discussions of economic or societal issues.

The student will be able to:

- 1) apply significant figures rules in all calculations providing the correct number of significant figures and units (Exp 1, 2, 6, 7, 10, 11 and 12)
- 2) convert between different units using conversion factors and dimensional analysis (Exp. 1)
- 3) name elements, provide their symbols and determine the number of protons, neutrons, electrons and nuclei in elements and compounds
- 4) calculate percent composition given a molecular formula and molecular formula given the percent composition (Exp. 2)
- 5) name salts, acids, bases and covalent compounds and provide formulas for these given a molecular formula (Exp. 3)
- 6) explain the difference between solubility and dissociation in water and apply this knowledge to acids, bases and salts (Exp. 3)
- 7) identify weak and strong acids and bases and insoluble compounds using dissociation and solubility rules and develop the net ionic representation for these species using the rules (Exp. 3 and 4)
- 8) construct molecular, total and net ionic equations for double displacement reactions (Exp. 3 and 4)
- 9) identify redox reactions including identifying the oxidation, reduction, oxidation agent and reducing agent (Exp. 5)
- 10) calculate oxidation numbers and balance redox reactions (Exp. 5)
- 11) perform stoichiometry calculations for chemical and non-chemical systems whether the limiting reactant is known or unknown (Exp. 6 and 10)
- 12) calculate molarity of a solution starting with pure solute or with a concentrated solution as well as explain how to prepare a solution of a given molarity (Exp. 6)
- 13) provide brief descriptions of the accomplishments of Planck, Einstein, Thompson, Rutherford, Millikan, Rydberg, Bohr, de Broglie and Schrodinger; and how these contributed to understanding the atom

- 14) explain how a cathode ray tube works and how it assisted in understanding the electronic configuration of atoms.
- 15) convert between wavelength, energy and frequency for light and understand the relationship between absorbed light and color (Exp. 7)
- 16) calculate the energy and wavelength of a given electronic transition in hydrogen (Exp. 7)
- 17) define what each quantum number represents and how to obtain quantum numbers for any electron in an atom
- 18) analyze an atom or ion of a given element providing the full electronic configuration, the abbreviated electronic configuration, the nl^x notation, a representative diagram of the orbitals and the unpaired number of electrons; then use this information to determine the possible oxidation states of the element and the magnetic properties of the element (Exp. 8)
- 19) define electronegativity, electron affinity and ionization potential
- 20) organize a set of element or monoatomic ions in order of increasing atomic radius, ionic radius, first ionization energy and electronegativity
- 21) determine whether a bond is metallic, ionic, covalent or polar covalent
- 22) represent covalent and ionic bonding using Lewis dot structures
- 23) evaluate the molecular geometry, hybridization and polarity of a covalent molecule (Exp. 9)
- 24) evaluate the type of molecular bonding (σ or π) in a covalent molecule and identify the orbitals used for bonding
- 25) explain the properties of temperature and pressure including how these are measured and convert between different units for these properties, including the use of different liquids in the measurement of pressure (Exp. 10)
- 26) derive the relationships between pressure, volume, temperature and moles for ideal gases; perform calculations using these relations, including when they are combined with stoichiometry or percent composition problems (Exp. 10)
- 27) define and apply Dalton's Law of Partial Pressures and Graham's Law of Diffusion and Effusion to mixtures of gases (Exp. 10)
- 28) use the results from the Kinetic Molecular Theory of Gases to explain the relationship between kinetic energy, average molecular velocity, temperature, pressure, density and number of collisions when an ideal gas undergoes a change of state
- 29) describe and provide examples of the five types of intermolecular forces and be able to analyze the forces present in a substance and organize a set of compounds in order of increasing intermolecular forces (Exp. 11)

- 30) define the terms and explain the temperature dependence of surface tension, viscosity, vapor pressure, normal boiling point, capillary action; and be able to organize a set of compounds in increasing order for most of these properties (Exp. 11)
- 31) explain the concept of specific heat and apply the equation to heating or cooling of materials
- 32) perform heat transfer calculations for systems with and without phase changes (Exp 12)
- 33) calculate heats of reaction using Hess' Law or heats of formation, including combining the process with stoichiometry, and identify whether the reaction is exothermic or endothermic (Exp 12)
- 34) name unsubstituted and substituted alkanes, alkenes and alkynes given a drawing of a molecule and vice versa
- 35) identify all the isomers associated with simple aliphatic hydrocarbons and predict boiling point and vapor pressure change as a function of the number of carbons
- 36) identify and name the organic functional groups in a molecule

Chem 1A – Spring 2019 – *Tentative* Lecture Schedule

(Dr. Migicovsky reserves the right to change Exam Days. Changes will be noted on Canvas.)

Aug. 21	First day of class
Sept. 2	Labor Day – NO CLASS
Sept. 3	Last day to drop a class
Sept. 10	Last day to add a class
Sept. 27	Lecture Exam I
Oct. 25	Lab Exam I – Exam is during the seminar period
Oct. 30	Lecture Exam II
Nov. 11	Veteran’s Day – NO CLASS
Nov. 25	Lecture Exam III
Nov. 27-29	Thanksgiving Holiday – NO CLASS
Dec. 6	Lab Exam II - Exam is during the seminar period
Dec. 9	Last day of class
Dec. 13	Final Exam at 12:15 PM