

**San José State University**  
**College of Science/Department of Chemistry**  
**Chem 1A (40100), General Chemistry, Section 2, Fall, 2019**

**Course and Contact Information**

Instructor:	Professor Lionel Cheruzel
Office Location:	DH 286
Telephone:	(408) 924-5283
Email:	<a href="mailto:lionel.cheruzel@sjsu.edu">lionel.cheruzel@sjsu.edu</a>
Office Hours:	MWF 2:00 PM to 3:00 PM, or by appointment
Class Days/Time:	MWF 10:30AM – 11:20AM
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 must be eligible to take MATH 019; EPT requirement must be met

**Course Format**

**Technology Intensive**

This course requires you to make use of multiple forms of technology. Online homework, Mastering Chemistry, will be required and i-clicker/reef polling will be used in class to measure your participation. In addition, you will be expected to consistently and frequently check the Canvas Learning Management System at <http://sjsu.instructure.com> for course materials such as the syllabus (greensheet), handouts, notes, assignment instructions, etc. Online quizzes will also be administered through Canvas. During the first 3 weeks of the semester when students are still trying to get enrolled, they may be added to Canvas as guests until a decision is made on enrollment. Please email Professor Cheruzel should you wish to be added as a guest until your status in the class changes. You are responsible for regularly checking with the messaging system on Canvas through MySJSU to learn of any updates.

**Course Description**

The object of the course is to gain knowledge and understanding of the basic principles of chemistry, and of their applications. The overall goal is to be able to demonstrate an understanding of the basic principles of chemistry on clicker questions, quizzes, exams and online web homework. Lab and seminar complement lecture; however, please note that sometimes lab will be used as an introduction to the concepts covered in lecture and other times the labs will reinforce what is covered in the lecture. In the case of an introduction, you may need to do preparatory reading for the lab. The chapters in the textbook (Brown et. al.) that coincide with the labs are marked on the lab greensheet (Homework Section p. 11-13).

## Course Goals

The overall goal is for the student to be able to demonstrate an understanding of the basic principles of chemistry through performance on clicker questions, quizzes, exams and online web homework. Lab and seminar complement lecture; however, please note that sometimes lab will be used as an introduction to the concepts covered in lecture and other times the labs will reinforce what is covered in the lecture. In the case of an introduction, you may need to do preparatory reading for the lab.

## Program Learning Outcomes (PLO)

The following PLOs (think of these as learning goals) for SJSU's BA/BS chemistry program have been established by faculty members of the SJSU Chemistry Department and apply to CHEM 1A students. Chem 1A provides a basic foundation for learning chemistry concepts that cross-cut to a variety of chemistry disciplines, as a result, core concepts will be introduced in Chem 1A, but they will be further developed as students advance through a progression of more specialized courses. For a full list of program learning outcomes visit -

[http://www.sjsu.edu/chemistry/Academic\\_Programs/undergraduate\\_program\\_learning\\_objectives.html](http://www.sjsu.edu/chemistry/Academic_Programs/undergraduate_program_learning_objectives.html)

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 #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 (CLO)

Course learning outcomes describe the behavior of learning that students taking the course are expected to demonstrate proficiency in as they progress through the course and at the end of the course on the final exam.

Upon successful completion of this course, students 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 (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, 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 (s or p) 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 some organic functional groups in a molecule

## **Required Texts/Readings**

### **Textbook**

Mastering Chemistry to accompany the textbook -Chemistry: The Central Science – Brown, LeMay and Bursten. This is an online homework system that will also include access to the latest edition of the textbook by Brown et al. To register, please follow the instructions posted on Canvas.

### **Other Readings**

Lab Manual for Chemistry 1A - Sold during the first 2 weeks of school by the Chemistry Student Club (DH20 - basement) – Cash Only (\$20).

## Other technology requirements / equipment

- 1) Register for the iClicker and CHEM 1A F19 with Prof. Lionel Cheruzel. You must be registered to earn points and you must be registered by the last day to add the class. For information on how to get set up with i-clicker, visit the following site <https://vimeo.com/200122938>. Note: One important element is when you create your account, you must include your 9-digit SJSU ID. eCampus will loan you an i-clicker if you do not have a cell phone or do not wish to use your phone in class. However, most students find that using their cell phone is easier than checking out an i-clicker.
- 2) Hand-held scientific calculator - Must be non-programmable and should have log x, 10x, ln x, ex and xy keys. You will not be allowed to use your programmable calculator during a lecture nor lab exam, nor a quiz!

## Optional Materials and Resources

- 1) **Academic Excellence Workshops to help you study for Chem. 1A.** These are 3-hour per week organized study sessions.
- 2) Peer Mentors – assistants who will be assigned to this course to provide support with many aspects of the course and its content.
- 3) Other Chemistry texts – There are a variety of approaches to teaching chemistry and you may find one a better fit for your comprehension. You can check out additional textbooks from the library.
- 4) Solutions manuals to textbook problems - These options are available with your textbook, but probably unnecessary as the electronic system will assist you with all aspects of understanding the problems and homework will be assigned from Mastering Chemistry, not the hardback book.
- 5) Student Study Guide for the textbook. – More worked-out problems and many more practice problems.
- 6) Suggested items to purchase for lab: small notebook to keep in your drawer (or you can staple together 15 sheets of lined paper), safety glasses and a china marker (sold at bookstore).

## Course Requirements and Assignments

After every class, Professor Cheruzel will provide an overview of the key concepts covered and some handouts. This will be in Canvas and listed by the date that the class was taught. You are expected to use these overviews like you would use a study guide – master the concepts that are referenced in the manner suggested. Next, check the Mastering Chemistry site for problems assigned. Problems will be assigned after each class and you will be given a range of time to complete the assigned problems. Be very mindful of the due dates of assignments. Homework will be counted as approximately 14% of your grade.

**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 three hours per unit per week) for instruction, preparation/studying, or course related activities, including but not limited to internships, labs, and clinical practices. Other course structures will have equivalent workload expectations as described in the syllabus.**

## Final Examination or Evaluation

Three fifty-minute exams (100 points each) will be given approximately every fourth week. Dates for the exams are on the course schedule. **Please plan accordingly.** The final exam (200 points) is a comprehensive multiple choice/True-False item test (maximum of 100 questions) that covers CHEM 1A topics. 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 before the exam is given. You can do so by e-mail or by leaving a message in my voice mail, including a phone number where you can be reached. You will need to provide me with written evidence (doctor's note, police report, etc.) for your excuse. If I accept your excuse, I will use the score on the final as your missing exam score. An unexplained or unsatisfactory excuse for missing a lab or exam will result in a grade of zero.

**The final exam shall be held on Dec 12<sup>th</sup> from 9:45 AM – 12:00 PM in SCI 142.**

Per [University policy S17-1](http://www.sjsu.edu/senate/docs/S17-1.pdf) (<http://www.sjsu.edu/senate/docs/S17-1.pdf>), Faculty members are required to have a culminating activity for their courses, which can include a final examination, a final research paper or project, a final creative work or performance, a final portfolio of work, or other appropriate assignment.

### Grading Information - Grading Scale

At the end of the semester you will receive a single grade for the course. The following grading scale is used for determining your overall grade, which is a weighted average of lecture (65%) and lab (35%). Your percentage is rounded to the one-tenth place and that number determines your grade. Please note that grades are non-negotiable; however, if an error is made you should contact your professor immediately.

above 97.0 %	A+	96.9 - 91.0 %	A	90.9 - 88.0 %	A-
87.9 - 84.0 %	B+	83.9 - 79.0 %	B	78.9 - 76.0 %	B-
75.9 - 71.0 %	C+	70.9 - 64.0 %	C	63.9 - 60.0 %	C-
59.9 - 56.0 %	D+	55.9 - 53.0 %	D	52.9 - 50.0 %	D-
		Below 50.0%	F		

### Getting your exam grades

Check the Canvas website to learn how you scored on your exams. Always check your score, because grades, as they appear on Canvas will be used to determine your overall grade for the course. You will have approximately 3 weeks or until the time of the next exam to attend office hours to review your performance and if necessary request a regrade. Your grade for the exam will be final after the 3-week period or announcement that your time to review has ended. You will not be allowed to review the exam again, nor ask for it to be regraded, which means in the weeks prior to finals you will not be allowed to review old exams or claim an issue with the grade.

**Quizzes:** These will be given on a biweekly basis (approximately). The quizzes will be posted on Canvas. Be mindful of due dates. Also, note that quiz scores will be scaled to a value of 20 points each.

**Homework:** We will be using an online learning homework system called Mastering Chemistry this semester. Please follow the instructions to register for it. Your access will be good for 6 months.

**REEF Polling/iClicker Participation:** Throughout each class you can expect to be asked to participate and iClickers/ REEF polling will be used to check your participation and help you to determine if you are mastering the material. You must complete at least 50% of the clicker questions offered during a class period to be rewarded for your participation. It is very important that you either register your iClicker right away or you sign your cell phone up for REEF polling (preferred by most students), but you must choose only one of these options (Clicker or REEF). If you do not register, you will not earn credit for your participation. Your participation will be shown on Canvas; however, be forewarned that this score will be scaled down at the end of the course and worth approximately 3.5% of your grade.

**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**, regardless of how well you are doing in lecture. Do not miss labs! Details regarding the lab grade will be provided in the lab/seminar greensheet.

### Determination of Grades

A record of your grades on Exams, Quizzes will be posted on CANVAS. Your homework percentage will be available through the Mastering Chemistry website and your participation will be available through REEF Polling. You are responsible for making sure that the scores posted on CANVAS are consistent with the grade you earned. If a mistake is made, you have 1 week from the time you receive your graded exam or quiz to contact Dr. Cheruzel to request the correction. If you notice a blank where the grade should be, check on it immediately. Homework and REEF participation will be consistently tracked throughout the semester and your final earned percentages in these areas will be entered in the tabulation of your final grade.

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 on exams! Incompletes are only given to persons who have completed at least 80% of the course. They are removed by completing pending tasks. I do not provide special projects to make up incompletes.

**PLEASE NOTE THAT I DO NOT** provide extra credit work at the end of the semester for students who are doing poorly. You need to perform well on your tests, lab reports, quizzes, homework and in your participation efforts.

**PLEASE NOTE THAT I** provide bonus points on exams through a few special bonus point questions. This is done to push your grade up a bit just in case you feel some grading was harsh or uneven. This may 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.

### Grade Record for CHEM 1A Students – Dr. Cheruzel

#### Lecture (65% of grade)

Exams (~70.9%)	Quizzes (~11.3%)	Mastering Chemistry Homework (~14.2%)	Participation (~3.5%)
1 (100) 2 (100) 3 (100) Comprehensive Final (200)	Typically, biweekly (approximately 4 quizzes = 20* points)	(Your points/ Total Points) x 100	Clicker questions/ Reef polling (your percentage multiplied by 25)
500	80*	100	25

\*Quiz scores could vary from this estimated value.

Your total number of points divided by the total amount of lecture points (705) gives you your Lecture %.

The Lab portion of the class must be passed with 55% or better. The total percentage earned determines your grade based on the grading scale provided above.

• **There is no extra credit.**

• **Late work or missed work is not graded and is counted as a zero. For example, if you miss a homework assignment, you will not be granted an extension, especially if your reason is that you did not observe the due date on the assignment or you ran out of time. Thus, the penalty for late work is a score of zero.**

**This course must be passed with a C or better as a CSU graduation requirement.**

### **Classroom Protocol**

- a) **Turn your cell phone off** prior to the start of lecture.
- b) **No headsets for cell phones or headphones/ear devices for music technology devices are allowed during lectures.** If you wear them, be prepared to remove them or you will be asked to leave the lecture.
- c) **Notebook computers will only be allowed if you sit in the very back rows.** Tablet computers/Ipads are allowed. If you are found to be using their computer inappropriately (ex. surfing the Internet, emailing) you will be asked to leave the class – all clicker/REEF questions will be scored as zero.
- d) No text messaging, unless you are instructed to do so as part of the class! If it is noticed that you are text messaging during class– you will be asked to leave the lecture.
- e) Cell phones will not be allowed to double as your simple scientific calculator. They should be turned off, and placed in a backpack.
- f) Before emailing Dr. Cheruzel, please ask yourself whether the information you seek could be found in the greensheet.
- g) Lecture requires you being awake. If you decide to take a snooze, you may be asked to leave the lecture so that you can catch up on your rest in a more comfortable setting.
- h) If you are late for class on the day of a test or quiz, you will not be given extra time to finish nor will you be allowed to make-up the exam or quiz. If you take mass transit—you need to plan ahead to make sure that you get to the campus in plenty of time.
- i) If you do not fill in the bubbles until the end of the exam, please know that you will not be awarded extra time to finish the task and the grader will not hand grade your exam just because you did not budget your time accordingly.
- j) If you miss a class, you are responsible for getting the information you missed from a peer who was present and you should check Canvas.

### **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.

### **Lecture Exam Rules**

(There will be assigned seats—make sure you know where you sit!)

- 1) You must sit in the seat you are assigned. Dr. Cheruzel will provide the seating chart on Canvas. Check the seating chart well before the exam date! It will be posted a week before, both in lecture and online. Find the seat in the lecture hall a few days before the exam so that you do not waste time



looking for it! If you reach your seat and it is broken, please inform Dr. Cheruzel and a new one will be assigned. No sitting on the floor in the back of the lecture hall or on the stairs!

- 2) No programmable calculators. No sharing of calculators. (This applies to lab also!). Remove the calculator lid before the exam.
- 3) No caps, hats, etc. unless required by a physician and then they must be turned around.
- 4) No cell phones, iWatches or PDAs. They must be stored under your seat or in your backpack and be sure to mute or turn it off.
- 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 or at the front of the room so as to make sure that others don't trip trying to get out. No open books, no notes, etc. on the floor at your feet or even closed and used to cushion your writing.
- 8) No talking during an exam, even if you have handed in your exam.
- 9) Be mindful of all instructions oral and written.
- 10) No notes, open books, lab manuals or any other materials should be available.

### 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/>

## Chem 1A-02 / General Chemistry, Fall 2019, Course Schedule

Subject to Change with fair notice through Canvas or in-class announcement

### Exam Dates

Three Exams –

Exam 1 - Sept. 25<sup>th</sup> (Wednesday)

Exam 2 - Oct. 31<sup>th</sup> (Wednesday)

Exam 3 – Nov. 22<sup>th</sup> (Friday)

Final Exam – Dec. 12<sup>th</sup> (Thursday)– 9:45AM to 12:00PM –

Please note that the final exam is cumulative and will consist of no more than 100 items - primarily multiple choice and true/false questions. You will need to purchase Scantron – 882E for use on the final exam.

### Quiz Dates

Four Quizzes –

Quiz 1 – Assign Sept. 6<sup>th</sup> /due Sept. 9<sup>th</sup> at 10:00AM

Quiz 2 - Assign Oct. 11<sup>th</sup> /due Oct. 14<sup>th</sup> at 10:00AM

Quiz 3 – Assign Nov. 8<sup>th</sup> /due Nov. 13<sup>th</sup> at 10:00AM

Quiz 4 – Assign Dec. 6<sup>th</sup>/due Dec. 9<sup>th</sup> at 10:00AM

## Chem 1A-02 / General Chemistry, Fall 2018, Course Schedule

Week	<i>Tentative Lab Schedule</i>	Date Q = Quiz, E = Exam	Topics
1		Aug. 21, Aug. 23	Greensheet/Syllabus Review, Intro To Atomic Structure
2	Check-in	Aug. 26, Aug 28, Aug 30	Atomic Structure – Atomic Number, Mass Number, Ions, Properties Of Atoms, Isotopes, Dalton’s Atomic Theory, Atomic Weights, Mole
3	Exp. 1 Basics	Sept. 4, <b>Sept. 6<sup>Q1</sup></b>	Naming Ionic And Molecular Compounds, Molar Mass Calculations, Polyatomic Ions, Formulas – Molecular And Empirical,
4	Exp. 2 – Hydrate	<b>Sept. 9<sup>Q1</sup></b> , Sept. 11, Sept. 13	Reactions – Symbolic Representation, Balancing Equations, Stoichiometry, Theoretical And Actual Yield
5	Exp. 3 - Conductivity	Sept. 16, Sept. 18, Sept. 20	Molarity, Aqueous Solutions, Acid-Base, Titrations,
6	Exp. 4 – Mystery Bottles	Sept. 23, <b>Sept. 25<sup>Ex1</sup></b> , Sept. 27	Precipitation Reactions, Precipitation Reaction Quantities
7	Exp. 5 – Activity Series	Sept. 30, Oct. 2, Oct. 4	Single Replacement Reactions, Activity Series, Redox
8	Exp. 6 – Acid In Vit. C/Titration	Oct. 7, Oct. 9, <b>Oct. 11<sup>Q2</sup></b>	Light Evidence – Atoms, Nature Of Light, Quantum Mechanics Background, Orbitals, Quantum Numbers
9	Exp. 7 – Light & Color	<b>Oct. 14<sup>Q2</sup></b> , Oct. 16, Oct. 18	Electron Configurations, Orbital Diagrams, Periodic Properties
10	Exp. 8A Periodic Properties	Oct. 21, Oct. 23, Oct. 25	Lewis Dot Structures, Resonance, Molecular Shape, Valence Bond Theory
11	Exp. 9 & 8B – Molecular Models & Semiconductors	Oct. 29, <b>Oct. 31<sup>E2</sup></b> , Nov. 1	Gas Laws – Boyle’s Law, Charles’ Law, Avogadro’s Hypothesis, Ideal Gas Law Equation,
12	Exp. 10 - Ideal Gas	Nov. 4, Nov. 6, <b>Nov. 8<sup>Q3</sup></b>	Dalton’s Law Of Partial Pressure Effusion, Diffusion
13	Exp. 11 – Intermol. Forces	<b>Nov. 13<sup>Q3</sup></b> , Nov. 15	Liquids, Intermolecular Forces, Surface Tension, Viscosity, Capillary Action, Vapor Pressure
14		Nov. 18, Nov. 20, <b>Nov. 22<sup>E3</sup></b> ,	Intermolecular Forces, Phase Changes
15	Exp. 12 – Hess’ Law/ Heats of Reaction	Nov. 25	Thermochemistry, Hess’ Law, Enthalpy,
16	No Labs	Dec. 2, Dec. 4, <b>Dec. 6<sup>Q4</sup></b>	Solids – Crystalline Arrangements, Organic Chemistry
17	Checkout	<b>Dec. 9<sup>Q4</sup></b>	Organic Chemistry, Review
<b>FINAL EXAM is Dec 12<sup>th</sup> 9:45 AM – 12:00 PM</b>			