Course and Contact Information

Instructor: Professor Resa Kelly
Office Location: DH 418
Telephone: (408) (924-4940)
Email: resa.kelly@sjsu.edu
Office Hours: Monday and Wednesdays 1:00 to 2:00PM
Class Days/Time: MWF 9:30AM-10:20AM
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 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.

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 Madra. 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 Kelly 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. See University Policy F13-2 at http://www.sjsu.edu/senate/docs/F13-2.pdf for more details.

Canvas Learning Management System

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on Canvas Learning Management System course login website at http://sjsu.instructure.com. You are responsible for regularly checking with the messaging system through MySISU at http://my.sjsu.edu to learn of any updates.

Course Description

The object of the course is to gain knowledge and understanding of the basic principles of chemistry. Topics include: stoichiometry, reactions, atomic structure, periodicity, bonding, states of matter, energy changes, solutions using organic and inorganic examples. Lab program complements lecture.

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. 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 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:

**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

3) calculate percent composition given a molecular formula and molecular formula given the percent composition (Exp. 2)

4) name salts, acids, bases and covalent compounds and provide formulas for these given a molecular formula (Exp. 3)

5) explain the difference between solubility and dissociation in water and apply this knowledge to acids, bases and salts (Exp. 3)

6) identify weak and strong acids and bases and insoluble compounds using dissociation and solubility rules (Exp. 3 and 4)

7) construct molecular, total and net ionic equations for double displacement reactions (Exp. 3 and 4)

8) identify redox reactions including identifying the oxidation, reduction, oxidation agent and reducing agent (Exp. 5)

9) calculate oxidation numbers and balance redox reactions (Exp. 5)

10) perform stoichiometry calculations for chemical and non-chemical systems whether the limiting reactant is known or unknown (Exp. 6 and 10)

11) 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)

12) 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

13) explain how a cathode ray tube works and how it assisted in understanding the electronic configuration of atoms.

14) convert between wavelength, energy and frequency for light and understand the relationship between absorbed light and color (Exp. 7)

15) calculate the energy and wavelength of a given electronic transition in hydrogen (Exp. 7)

16) define what each quantum number represents and how to obtain quantum numbers for any electron in an atom

17) 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)

18) define electronegativity, electron affinity and ionization potential
19) organize a set of element or monoatomic ions in order of increasing atomic radius, ionic radius, first ionization energy and electronegativity

20) determine whether a bond is metallic, ionic, covalent or polar covalent

21) represent covalent and ionic bonding using Lewis dot structures

22) evaluate the molecular geometry, hybridization and polarity of a covalent molecule (Exp. 9)

23) evaluate the type of molecular bonding (s or p) in a covalent molecule and identify the orbitals used for bonding

24) 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)

25) 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)

26) define and apply Dalton’s Law of Partial Pressures and Graham’s Law of Diffusion and Effusion to mixtures of gases (Exp. 10)

27) 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

28) describe and provide examples of the five types of intermolecular forces and be able to analyze the forced present in a substance and organize a set of compounds in order of increasing intermolecular forces (Exp. 11)

29) 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)

30) explain the concept of specific heat and apply the equation to heating or cooling of materials

31) perform heat transfer calculations for systems with and without phase changes (Exp 12)

32) 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)

33) name unsubstituted and substituted alkanes, alkenes and alkynes given a drawing of a molecule and vice versa

34) 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

35) identify and name some organic functional groups in a molecule

Textbook/Technology Requirements / Equipment

1. Mastering Chemistry to accompany the e-textbook - Chemistry: The Central Science – Brown, LeMay and Bursten (~$85) This is an online homework system that will also include access to the latest edition of the textbook by Brown et al.

2. Lab Manual for Chemistry 1A - Sold during the first 2 weeks of school by the Chemistry Student Club (DH20 - basement) - They only take cash (~$20).

3. Madra Learning Account for quizzes and pre-tests (~$10)

4. Reef-Polling (also known as i-clickers) (free to SJSU students)
   Register for CHEM 1A with Prof. Resa Kelly. 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 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.
5. **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 a programmable calculator during a lecture nor lab exam.

### Course Requirements and Assignments

After every class, Professor Kelly will provide an overview of the key concepts covered. This will be in Canvas under Discussions and listed by the date that the class was taught. You are expected to use these overviews like you would use a study guide—to master the concepts that are referenced in the manner suggested. Next, check the Mastering Chemistry site for homework 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 12.5% of your grade.

**Additional Information:**
- [University Syllabus Policy S16-9](http://www.sjsu.edu/senate/docs/S16-9.pdf)
- [Office of Graduate and Undergraduate Programs’ Syllabus Information web page](http://www.sjsu.edu/gup/syllabusinfo/University Policy S16-9)

“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 practica. Other course structures will have equivalent workload expectations as described in the syllabus.”

### Examinations

**Three fifty-minute exams** (100 points each), will be given approximately every fourth week. **Four Online Quizzes** through Madra will be given 2 weeks prior to each exam. Dates for the exams are on the course schedule. Please plan ahead. **Quizzes (20-25 points each)** and **Pre-tests (Exam prep, worth 25 points)** will be given through your Madra Learning account.

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.

**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** will be assigned on a Friday and you will have until the start of class time on Monday to complete them online through Madra. You will be given 3 chances to take the quiz during the quiz window of Friday-Monday.

### Final Examination

The final exam (200 points) is a comprehensive multiple choice/True-False item test (maximum of 100 questions) that covers CHEM 1A topics. The final exam shall be held on Friday, Dec. 14th from 7:15AM to 9:30AM in SCI 142.

[University policy S17-1](http://www.sjsu.edu/senate/docs/S17-1.pdf) **which states that**

“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.”

### Homework and Participation

1. **Homework – Mastering Chemistry:** 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.

2. **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 poling (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 3.1% of your grade.

Grading Information

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

- University Syllabus Policy S16-9 (http://www.sjsu.edu/senate/docs/S16-9.pdf)
- University Attendance and Participation Policy F15-12 (http://www.sjsu.edu/senate/docs/F15-12.pdf)

Grading Scale

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A+</td>
<td>96.9 - 91.0%</td>
</tr>
<tr>
<td>A</td>
<td>90.9 - 88.0%</td>
</tr>
<tr>
<td>B+</td>
<td>83.9 - 79.0%</td>
</tr>
<tr>
<td>B</td>
<td>78.9 - 76.0%</td>
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<tr>
<td>C+</td>
<td>70.9 - 64.0%</td>
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<tr>
<td>D+</td>
<td>55.9 - 53.0%</td>
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<tr>
<td>D</td>
<td>52.9 - 50.0%</td>
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<td>F</td>
<td>Below 50.0%</td>
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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. Kelly 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 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. Kelly

<table>
<thead>
<tr>
<th>Lecture (65% of grade)</th>
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<tbody>
<tr>
<td>Exams (~62.5%)</td>
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<tr>
<td>1(100)</td>
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<tr>
<td>2(100)</td>
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<tr>
<td>3(100)</td>
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<tr>
<td>Comprehensive Final (200)</td>
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</table>
*Quiz scores could vary from this estimated value.*

Your total number of points divided by the total amount of lecture points (800) 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. The total lab grade constitutes 35% of the final grade.** Your Teaching Assistant (TA) will review how your grade in lab is determined. If you should fail lab (55.0% or less or due to unexcused absences) this will result in an F grade for the FULL COURSE, regardless of how well you are doing in lecture. Details regarding the lab grade will be provided in the lab/seminar greensheet(syllabus).

- 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.

**Classroom Protocol**

a) **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.

b) **Notebook computers will only be allowed if you sit in the very back rows.** Tablet computers/iPads are allowed.

c) Cell phones will not be allowed to double as your simple scientific calculator. They should be turned off, and placed in a backpack.

d) 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.

e) 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.

f) 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 — if one is provided — Dr. Kelly will let you know if a seating chart will be used. In the event that a seating chart is assigned, 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 can relax and prepare for the test. If you reach your seat and it is broken, please inform Dr. Kelly 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) Turn baseball caps so that the brim is to the back.

4) No cell phones, iWatches or techno gadgets. 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) Only scratch paper that is given to you may be used.

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.

CHEM 1A / General Chemistry, Fall 2018, Course Schedule – Subject to Change with fair notice through Canvas or in-class announcement

Exam Dates
Three Exams - Exam 1 - Sept. 19th (Wednesday), Exam 2 - Oct. 24th (Wednesday) and Exam 3 - November 30th (Friday), all exams are held in SCI 142 from 9:30 to 10:15PM (5 minutes for handing in exams at the end)

Final Exam – Dec. 14th (Friday) – 7:15 to 9:30AM in SCI 142 – Please note that the final exam is cumulative and will consist of no more than 100 items - primarily multiple choice and true/false questions.

Quiz Dates
Four Quizzes – Quiz 1 – Assign Sept. 7th /due Sept. 10th at 9:00AM, Quiz 2 - Assign Oct. 5th /due Oct. 8th at 9:00AM, Quiz 3 – Assign Nov. 9th /due Nov. 14th at 9:00AM, and Quiz 4 – Assign Dec. 7th /due Dec. 10th at 9:00AM.

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 at http://www.sjsu.edu/gup/syllabusinfo/

CHEM 1A / General Chemistry, Fall 2018, Course Schedule*

<table>
<thead>
<tr>
<th>Week</th>
<th>Tentative Lab Schedule</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Q = Quiz, E = Exam</td>
</tr>
<tr>
<td>1</td>
<td>No Lab</td>
<td>Aug. 22, Aug. 24 (Greensheet quiz – on Canvas)</td>
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<tr>
<td>2</td>
<td>Check-in, Safety Discussion</td>
<td>Aug. 27, Aug. 28, Aug. 31</td>
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<tr>
<td>3</td>
<td>Exp. 1 Basics</td>
<td>Sept. 5, Sept. 7Q1</td>
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<tr>
<td>4</td>
<td>Exp. 2 – Hydrate</td>
<td>Sept. 10Q1, Sept. 12, Sept. 14</td>
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<tr>
<td>5</td>
<td>Exp. 3 - Conductivity</td>
<td>Sept. 17, Sept. 19Ex1, Sept. 21</td>
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<tr>
<td>6</td>
<td>Exp. 4 – Mystery Bottles</td>
<td>Sept. 24, Sept. 26, Sept 28</td>
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<tr>
<td>7</td>
<td>Exp. 5 – Activity Series</td>
<td>Oct. 1, Oct. 3, Oct. 5Q2</td>
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<tr>
<td>8</td>
<td>Exp. 6 – Acid In Vit. C/Titration</td>
<td>Oct. 8Q2, Oct. 10, Oct. 12</td>
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<tr>
<td>9</td>
<td>Exp. 7 – Light &amp; Color</td>
<td>Oct. 15, Oct. 17, Oct. 19</td>
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<tr>
<td>#</td>
<td>Exp. 8A Periodic Properties</td>
<td>Oct. 22, Oct. 24&lt;sup&gt;1&lt;/sup&gt;, Oct. 26</td>
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<tr>
<td>11</td>
<td>Exp. 9 – Molecular Models</td>
<td>Oct. 29, Oct. 31, Nov. 2</td>
</tr>
<tr>
<td>12</td>
<td>Exp. 10 - Ideal Gas Exp. 8B - Semiconductors</td>
<td>Nov. 5, Nov. 7, Nov. 9&lt;sup&gt;3&lt;/sup&gt;</td>
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<tr>
<td>13</td>
<td>Exp. 11 – Intermol. Forces</td>
<td>Nov. 14&lt;sup&gt;3&lt;/sup&gt;, Nov. 16</td>
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<tr>
<td>14</td>
<td></td>
<td>Nov. 19</td>
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<tr>
<td>15</td>
<td>Exp. 12 – Hess’ Law/ Heats of Reaction</td>
<td>Nov. 26, Nov. 28, Nov. 30&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td>16</td>
<td>Checkout</td>
<td>Dec. 3, Dec. 5, Dec. 7&lt;sup&gt;4&lt;/sup&gt;</td>
</tr>
<tr>
<td>17</td>
<td>No Labs</td>
<td>Dec. 10&lt;sup&gt;4&lt;/sup&gt;</td>
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</tbody>
</table>

*Schedule is subject to change with fair notice and revisions will appear on Canvas.*

Final Exam is Friday, Dec. 14<sup>th</sup> – 7:15 to 9:30AM in SCI 142