Chemistry 4 (Chemical Calculations)  
Course Syllabus: Spring 2019

**Instructor:** Dr. Jeffrey Paradis (he, him, his)  
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**Phone:** (916) 278-6987

**Email:** jparadis@csus.edu  
[Include your full name and course section when emailing me. For homework questions, cut and paste the question from MasteringChemistry so I know exactly which question you are referring to. Also show all of your work so I can see where you are stuck; either type your work in your email or take a picture/scan your handwritten work and attach it to your email.]

**Web page:** https://www.csus.edu/indiv/p/paradisj/chm4/chm4.htm

**Lecture:** Sec 01: MWF 10:00 – 10:50 am (SQU 301)

**Instructor office hours:** MW 11:00 – 11:50 am (SQU 312). Office hours are first-come, first-served and no appointment is needed. Students who need to meet with me and are unable to make scheduled office hours should email me to set up an individual appointment.

**Required materials:** This is an IncludED course. You have paid for the course required materials through a course fee ($63). Do not purchase these materials through other sources as you have already paid for them. Your IncludEd course fee includes: 1) Pearson E-text for Introductory Chemistry by Nivaldo Tro, 2) Access to Mastering Chemistry (online homework), and 3) Learning Catalytics (student voting system, “clickers”). If you would like to be able to access your E-text even without Wi-Fi access, download the app “Pearson eText”.

Students who would like a loose-leaf copy of the textbook can purchase them in the bookstore for $50.00 [Introductory Chemistry by Tro (Loose Pgs, without Access Code) 6th Ed.; ISBN: 9780134564074]. Also, feel free to buy/rent any edition of Tro’s Introductory Chemistry (I’ve seen old editions for < $10 online). Several copies of the textbook have also been placed on reserve in the SacState library.

**Additional materials:**
- **Calculator:** Students should bring a non-programmable calculator with log and exponent functions to every lecture and exam period. Programmable calculators and cell phone calculators will not be allowed during exams. If you bring a programmable calculator (or none at all) to an exam, you will have to take the exam without a calculator. Alternatively, calculators can be checked out from the chemistry department stockrooms in SQU hall.
- **Scantrons:** Students will need 4 scantrons (#4521) for taking exams. (Bookstore, 0.30¢ each)

**Catalogue description:** Introductory chemistry for students who plan to major in a scientific field. Appropriate for students desiring to prepare themselves for Chemistry 1A. Emphasizes chemical nomenclature and techniques of chemical problem solving. Topics covered include: dimensional analysis; conversions between measuring units; weight, mole and chemical equations; density; elementary gas laws; heat and temperature; elementary acid and base chemistry; oxidation and reduction; solutions. 3 hours lecture. **Prerequisite:** High school algebra and college algebra; sufficient performance on the college algebra diagnostic test, or equivalent. **Units:** 3.0

**Who should take Chem 4:** The goal of this class is to prepare you to succeed in Chem 1A or Chem 1E. If you need to take Chem 1A/1E for your major and you do not have the required content prerequisite (i.e. a passing grade in high school chemistry or a passing score on the Chem 1A diagnostic exam), then Chem 4 is the place for you! If you are not planning on taking Chem 1A/1E, please talk to me so we can clarify if Chem 4 is an appropriate course based on your academic goals. Chem 4 is not meant for allied health students, unless they are exercise science or dietetics special majors (since these majors require Chem 1A). Chem 4 is not intended for students who need Chem 6A or Chem 5.
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Math prerequisites: Because Chem 4 involves algebraic problem solving, it is important that students have sufficient math skills in order to succeed. Students must meet at least one of the following prerequisites:

• ALEKS score of 61 or higher.
• Math 12 (college algebra, previously Math 11) completion with a C or better. For Spring 2019, concurrent enrollment in Math 12 is allowed with an ALEKS score of 51-60.
• AP Calculus score of 3 or higher.
• Previous or concurrent enrollment in a course where Math 12 is a prerequisite (such as Math 26A/B, Math 29, Math 30 or higher). Stats 1, Math 17 and 24 do not meet the requirements.

NOTE: Students planning on going on to CHEM 1E will need to have passed Math 29 (i.e. in Math 30 or Math 30 eligible) or have an ALEKS score ≥ 76.

Learning outcomes: To achieve the goal of preparing you for Chem 1A, you will be required to learn basic principles of chemistry, problem solving techniques, and the basic language and concepts of chemistry. Chem 4 will also provide you with the opportunity to develop study skills and attitudes to become more successful in future science classes. By the end of the semester, successful students will be able to...

• develop strong study skills that will serve as the foundation for success in future science courses.
• name and write the chemical formulae of ionic compounds, molecular compounds, acids, and bases.
• appropriately use significant figures, rounding, and scientific notation in measurements and calculations.
• convey an understanding of dimensional analysis, unit conversion, the metric system, and the general importance of the use of units in chemistry.
• write balanced chemical equations for various types of reactions, predict in what physical states the products and reactants will be found, and write ionic and net ionic equations.
• perform calculations related to the mole including molar mass calculations, mole-mole calculations, mole-mass calculations, mass-mass calculations, and other stoichiometric calculations.
• solve chemically related word problems.

Grading: Because the focus of Chem 4 is on content mastery and because competition for grades goes against the philosophy of team-work as practiced in this class, there will be no curving of grades. My goal is always to write exams that are fair to all students and that provide you with the opportunity to show how well you understand the material we have been learning. Your overall course grade will be rounded to the tenths place and will be based on the % format below. These grade cutoffs are firm. For example, an 89.94% is not considered to be an “A-” because when rounded to the tenths place it would be 89.9%. An 89.95% or above, however, would round to 90.0% and would earn an “A-”. Note: A grade of “C” or better is required to move on to Chem 1A/1E.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>F</td>
<td>0.0 – 59.9%</td>
</tr>
<tr>
<td>D</td>
<td>60.0 – 69.9%</td>
</tr>
<tr>
<td>C-</td>
<td>70.0 – 72.9%</td>
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<tr>
<td>C</td>
<td>73.0 – 76.9%</td>
</tr>
<tr>
<td>C+</td>
<td>77.0 – 79.9%</td>
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<tr>
<td>B-</td>
<td>80.0 – 82.9%</td>
</tr>
<tr>
<td>B</td>
<td>83.0 – 86.9%</td>
</tr>
<tr>
<td>B+</td>
<td>87.0 – 89.9%</td>
</tr>
<tr>
<td>A-</td>
<td>90.0 – 92.9%</td>
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<tr>
<td>A</td>
<td>93.0 – 100.0%</td>
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Student grade percentages will be based on the following breakdown of points:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Possible points</th>
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<tbody>
<tr>
<td>Homework (scaled to 50 pts)</td>
<td>50 pts</td>
</tr>
<tr>
<td>Clickers (scaled to 50 pts)</td>
<td>50 pts</td>
</tr>
<tr>
<td>3 Midterm Exams (100 pts each)</td>
<td>300 pts</td>
</tr>
<tr>
<td>Cumulative Final Exam (200 pts)</td>
<td>200 pts</td>
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<tr>
<td></td>
<td><strong>600 pts total</strong></td>
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Updated homework and clicker grades will be posted before each exam on Canvas. Exam grades will be posted on Canvas a few days after the exam. You are automatically enrolled in the Canvas course and can login using your SacLink ”user name” and “password”. See the class website for a link to the Canvas page.
Key dates: The following are important dates in Chem 4. Please mark them on your calendar.
• No class: Mar 15 – 22 (Spring break); Apr 1 (Cesar Chavez Day)
• Exam dates: Feb 20 (Exam #1); Mar 29 (Exam #2); May 1 (Exam #3)
• Final exam: Tuesday, May 14, 8:00 - 10:00 am (SQU 301)

Dropping your lowest exam grade: As a new opportunity that I’m offering this semester, students will be able to drop their lowest exam grade if they sign up to take the Learning and Study Strategies Inventory (LASSI) with a Commit to Study (C2S) peer mentor. Depending on the results of the first meeting, students may have additional, 30-minute meetings. LASSI provides feedback to students across 10 study skills-related domains including “time management”, “testing strategies” and “anxiety”. Students who score > 75% on all 10 LASSI domains are done with their commitment and will have their lowest exam dropped. Students who score between 50 – 75% will work with the C2S peer mentor to pick at least 2 areas to work on and will complete the associated worksheets (typically about 1 hour of homework for each worksheet) before returning for their follow up, 30-minute meeting. Students must complete the LASSI worksheet for any domains where they score <50%. Worksheets are typically completed two at a time with 30 minute follow up appointments until all the required worksheets are completed. Students must finish the C2S/LASSI appointments before Exam #3 to get credit for the process and to be able to drop their lowest exam.

Students who would like to take advantage of this opportunity should not wait until the first exam; it is recommended that they go ahead and make their first C2S appointment before taking Exam #1. More info on the Commit to Study program is available: www.csus.edu/nsm/c2s/

On-line homework (MasteringChemistry): Starting the first class period, homework is assigned daily throughout the semester and is due 1 hour before the start of the next class. The on-line homework system MasteringChemistry will be used for this course. Access to MasteringChemistry is included in your IncludEd course fee. The points for your homework will be normalized to a total of 50 points at the end of the semester. For example, if you earn a total of 250 out of a possible 280 points (i.e. 89.3%), your homework grade would be (250/280) x 50 = 44.6 pts. Remember, 50 points can make the difference of a +/- grade. There will be extra credit questions on several of the homework assignments.

In order to keep the amount of homework to a minimum I have divided each assignment into “optional” and “required”. Most of the “required” questions are worth 1 point each, though some are worth 2 or 3 points if they are expected to take you longer to complete. If you are able to do all the “required” problems without any trouble then I don’t want to give you a tedious amount of homework to do. However, if you are struggling with the “required” problems, the “optional” problems are an important resource. It is going to be up to you to determine if you are in good shape and, if not, to put in the extra time to master the material. Additional uses of the “optional” problems include: (1) try them before you do the “required” problems to make sure you understand the concepts, (2) go back to them if you are starting to lose points on the “required” problems, or (3) save them for review before you take an exam.

All homework is available for review for the entire semester; so you can go back and redo homework for practice (though it won’t change your grade). To get as much as possible out of your homework, it is important not to treat it as busy-work. Students who “request solutions” without putting effort into the question or who try to guess the answer are wasting the opportunity to learn from the homework.

Clickers (Learning Catalytics): In an effort to maximize student engagement in class as well as to encourage retention of the course material, we will be using the cloud-based, student-response system, Learning Catalytics in Chem 4. Access to Learning Catalytics is included in your IncludEd course fee. Students can use any internet-enabled portable electronic device (phone, laptop, tablet) to access and vote through Learning Catalytics. As with the implementation of any new technology, some problems may occur; please be flexible and understanding.

Each day there will be several questions presented throughout lecture for students to work on and then vote for their answer. There will be questions that review the previous day’s material (to motivate you to review
previous lectures), questions that cover the assigned textbook reading for that day (to motivate you to complete the assigned reading before lecture), and questions that test your comprehension of topics as they are being discussed (to motivate you to pay attention in class). Sometimes you will be asked to work alone on your clicker questions, but usually you will be allowed to work with your classmates. Points for clicker questions are: 0 points if you are absent; 1 point for each wrong answer; 2 points for each correct answer. On random days, we will have “double clicker points” with the following: 0 points if you are absent; 3 points for each wrong answer; 4 points for each correct answer. The points for your clicker responses will be normalized to a total of 50 points at the end of the semester. For example, if you earn a total of 110 out of a possible 130 points (i.e. 84.6%), your clicker grade would be (110/130) x 50 = 42.3 pts. If you forget your electronic device then you can see me after class in order to get 1 point for each question.

If a student is found voting with another student’s Learning Catalytics account when that student is not present (in order to make it appear that the student is present), both students will lose all their clicker points for the semester. Also, students should not be using Learning Catalytics to vote on questions unless they are present in class. If a student is found to be voting on questions when they are not present, they will lose all their clicker points for the semester. It is your responsibility to remember to bring your electronic device to class each day. In terms of attendance (see below), students who arrive late to class may be counted as absent for that day if two or more clicker questions have been asked by the time they arrive.

Attendance: Missing class (or even being a few minutes late) can impact on your grade. Students who skip lecture miss out on clicker points and important information that is covered only in lecture. In addition, lectures are used to help you focus your studies so that you know what I think is the most important material that you will be held accountable for on exams. b) Consider the Chem 4 data in the table below. The first column shows the number of classes a student missed during the whole semester. The second column shows what % of students with that attendance record passed the class. Many students might think that missing just 3 classes a semester is no big deal, but notice that only 50% of the students missing 3-5 classes ended up passing the class! Of the students missing 6 or more classes? Only 17% of them passed! Of course, perfect attendance doesn’t guarantee that you’ll pass the class (6.1% students with perfect attendance didn’t pass), but it is an important first step to success in Chem 4.

<table>
<thead>
<tr>
<th># of missed classes</th>
<th>% who passed the course</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>93.9 %</td>
</tr>
<tr>
<td>1-2</td>
<td>73.1 %</td>
</tr>
<tr>
<td>3-5</td>
<td>50.0 %</td>
</tr>
<tr>
<td>≥ 6</td>
<td>17.0 %</td>
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Missed assignments: I appreciate that sometimes life, work, and other classes can get in the way of our learning goals in CHEM 4. It is important that you build a strong foundation though, so please feel that you can keep me posted if you get behind and need help catching up.
- Absolutely no make-up exams will be given. Students who miss an exam will have the grade for their missed exam replaced with the % grade they earn on their final exam.
- Students who miss an occasional due date on their homework can email Jeff to get an extension.
- Students who are absent will normally earn 0 clicker points that day. However, students can have their absence excused and will then earn those missed points back. All excuses must be approved by Jeff and may require documentation (for example, a doctor’s note, a note from the coach of your University sports team, a funeral notice, or a court summons).

Student resources: To be successful in Chem 4, you will likely need to schedule 6-9 hours of time outside of class each week. I recommend that you schedule regular study time on your weekly calendar. To help you budget your time, the Chem 4 website details the amount of time that each assignment and reading is expected to take; you’ll see that after you leave most lectures, you’ll have between 2-3 hours of work that you’ll need to complete before coming to the next class. In addition to good time management skills, students who do well in Chem 4 also work hard to develop strong study skills.
Although Chem 4 requires a lot of work, you are all smart enough and capable of passing if you put in the time and take advantage of the available resources. In addition to the usual instructor office hours, we have some great resources to help you succeed:

- **PAL (peer assisted learning) sessions:** PALs are 1-unit activity sessions where students work in small groups on worksheets that Jeff has written. Each PAL is led by a trained peer facilitator. The PAL facilitators are not tutors, but they are students who passed Chem 4 and are there to help you figure out how to be successful in the class. Students enrolled in a PAL are expected to print out the PAL worksheets from the Chem 4 website and bring them to each PAL session. Time and locations of all the PALs will be posted on the Chem 4 website. To get added to a PAL, students should show up to one of the PALs during the first week and leave their name and student ID number with the PAL facilitator and he/she will add you. Spaces in PALs are limited to 15 and are filled on a first-come, first-served basis.

- **PAL leader office hours:** The PAL facilitators also have weekly office hours in SQU 248 for additional help. I will be posting PAL leader office hours on our class website as soon as they are finalized. All students, not just those in a PAL, are encouraged to take advantage of PAL leader office hours.

- **Commit to Study mentoring:** The Commit to Study program provides students with the opportunity to be paired up to work one-on-one with a peer mentor who has been trained to help students develop stronger study skills. If you would like to meet with a Commit to Study peer mentor, please email Jeff and he will refer you to the Commit to Study office (SQU 320).

**Professionalism:** Students disrupting class (including those who are talking while I am talking and those whose cell phones go off) may be asked to leave. Students coming to class late or those who will need to leave early are asked to sit near one of the doors. No photographing or recording is allowed during class without my permission. Please remove your earbuds and turn off music and videos once class has started.

**Cheating and plagiarism:** Students found copying or assisting other students in copying any graded class assignments will be subject to punishment. Punishment may range from receiving a zero on the assignment to expulsion from the University. Please refer to the CSUS statement on Academic honesty.

**Students with disabilities:** I am happy to accommodate your documented needs, so please discuss them with me after class or during my office hours early in the semester. Please refer to the following website for more information on University services: www.csus.edu/sswd

**Information regarding course repeats:** The Academic Repeat Policy and the Financial Aid Repeat Policy are separate. The Academic Repeat Policy allows students to repeat a course 2 times in an attempt to pass (a total of 3 attempts); however, the units associated with the repeated course will only count toward the student’s financial aid eligibility twice. For more information: www.csus.edu/student/CourseRepeatUpdate

**Dropping Chem 4:** The student ultimately has the responsibility of dropping courses.

- Students who do not officially withdraw from the course by the prescribed deadline and also fail to complete course requirements (so that it is not possible for normal evaluation of academic performance) will receive a grade of either “WU” (Withdrawal Unauthorized) or “F”. For purposes of grade point average, a “WU” is equivalent to an “F”. “WU” grades will not be assigned to students after Exam #2.

- A grade of incomplete, will only be assigned to students with a passing grade who have completed at least ¾ of the course (basically, they are just missing the final exam). Students will have a maximum of 1 year to make up the missing work or the grade will become an “F”.

The instructor reserves the right to make changes to the syllabus when deemed necessary for the success of the class.