

## SYLLABUS

### **Foundations of Chemistry for Chemistry and Biochemistry Majors CHEM 1400, Fall 2018**

#### **Description and Goals**

Welcome to CHEM 1400. This is a newly developed one semester course designed to provide a solid foundation in chemistry for students intending to major in Chemistry or Biochemistry. The course emphasizes core concepts that you will need to move on to organic chemistry.

CHEM 1400 is designed to promote understanding of fundamental concepts and big ideas, cultivate scientific logic and reasoning, foster analytical skills, and encourage mechanistic thinking. Contrary to traditional general chemistry courses that strive to cover textbook chapters, CHEM 1400 is focused on major themes that are at the heart of Chemistry and Biochemistry, such as structure and properties, bonding and interactions, energy, and change and stability. This will not be a traditional lecture course. It is designed to be an interactive experience in learning chemistry and train you how to think and reason like a scientist. You should expect to come to class prepared to work with your peers, solve problems, brainstorm ideas, and develop explanations for scientific observations. This course also aims to foster a sense of community and identity among Chemistry and Biochemistry majors, to provide you with a sense of belonging, excitement, and inspiration of how chemistry and critical thinking/analytical reasoning are core components of diverse and exciting careers.

The course curriculum and design have been motivated by research on teaching and learning that indicates students develop deeper understandings and higher level critical thinking skills when they are actively engaged, given opportunities to ask questions, construct explanations, solve problems, and explain their reasoning. The course also aims to create a cooperative learning environment in which students work together in order to build a sense of community and give students an opportunity to learn from one another.

The curriculum material has been strongly influenced by CLUE (Chemistry, Life, Universe, Everything developed by Dr. Melanie Cooper and Michael Klymkowsky, <https://clue.chemistry.msu.edu> ).

The following syllabus explains how this course is organized and what is expected of you. Please read this material carefully and thoroughly.

## **Course and Contact Information**

There are two identical sections of this course: 100 (taught by Professor Palmer at 9 am) and 200 (taught by Professor Parson at 11 am). Both sections will use the same materials and will have the same exams, which will be administered together. Contact info for Professor Palmer and Professor Parson are provided below. Please feel free to attend either Professor's office hours, regardless of the section in which you are enrolled.

### **Section 100**

**Instructor:** Dr. Amy Palmer

**Office:** JSCBB C317 (East campus)

**Phone:** (303) 492-1945 (office)

**Email:** [Amy.palmer@colorado.edu](mailto:Amy.palmer@colorado.edu)

Please indicate "CHEM 1400" in the subject line

### **Section 200**

**Instructor:** Dr. Robert Parson

**Office:** JILA A609

**Email:** [Robert.parson@colorado.edu](mailto:Robert.parson@colorado.edu)

Please indicate "CHEM 1400" in the subject line

### **Course Teaching Assistants**

Laura Maurer, Steven Scappaticci, Samuel Rossabi, Ryan Dill

### **Course Learning Assistants**

Niamh Brown, Bobby Meushaw, Lindsey Peck, Shaan Sharma

### **Other Important Contact Information:**

*Administrative issues for the course* (drop-add, wait list, documentation for exam absence, etc.):

Ms. Anne McWilliams

Ekeley M199, Phone: (303) 492-8950

*Serious administrative issues involving recitation or teaching assistants:*

Dr. Christine Kelly

Email: [Christine.Kelly@colorado.edu](mailto:Christine.Kelly@colorado.edu)

## **Course organization in a nutshell**

**Class period:** 9:00 – 9:50 or 11:00 – 11:50 MWF in Gold A120

**Recitation period (attendance required):** Thurs (section 161, 162, 171, 172, 261, 271, 272)

**Mid-term exams:** Tues evenings 6 – 7:50 pm in HUMN 1B50 (Sept 18, Oct 16, Nov 13)

**Research poster session (attendance required):** Thurs Dec 13 4:30-6:30, JSCBB Main lobby

**Weekly homework:** ALEKS online

**Expectations:**

1. Read the textbook readings (CLUE and Zumdahl) **before** coming to class.
2. Watch any recommended video materials (YouTube, Khan Academy, etc) prior to class and take the video quiz posted online. To receive credit you must take the quiz prior to class. All quizzes will be inactivated at 9 am on the day they are due.
3. Come to class prepared to work with your peers and engage in the material. Each class period will involve student-centered collaborative activities. You may be asked to work individually or in groups. Many activities will involve the use of tablets to make predictions, play with simulations, and record your group's real-time response to questions. Class periods will be a mix of Clicker questions to stimulate discussion and assess your understanding of material, group and individual activity sessions, and lecture. We may call on you during class to contribute to a discussion at hand.
4. Be on task during class. Please refrain from text, social media, or other distractions.
5. Use weekly ALEKS assignments to practice problem solving, master basic concepts, and develop a core foundation of chemistry knowledge.

**Course Website (Desire2Learn)**

The URL for the Desire2Learn (D2L) Web page is: <https://learn.colorado.edu>  
You must login using your CU identikey and password.

**Texts and Other Materials****Required Text & Materials****(Available in the CU Bookstore)**

1. CLUE Textbook (available as a pdf on D2L)
2. Chemistry: An Atoms First Approach by Zumdahl and Zumdahl, 2<sup>nd</sup> edition
3. ALEKS 6 month/180 day access pass (\$60) **Course code: MPCL4-6EG3G**
4. An i>clicker for **Clicker concept checks** in lecture.
5. A **scientific electronic calculator**. Calculators should be capable of using scientific notation and of taking logarithms and exponentials. Programmable calculators **are** allowed during examinations, **but you must clear all programs before the start of the exam**. Calculators may not be shared during exams. Anyone violating this policy will receive a zero for the exam. Subsequent violations could lead to an "F" in the course, and the student will be reported to the Honor Code Council.
6. Notebook for class for participating in class activities.

**Clicker concept checks**

Research has shown that students learn more when they are actively engaged in class. To facilitate your engagement and to provide feedback to you and the instructor, we will use the i>clicker system in class. Each student must purchase an i>clicker to participate in clicker

questions presented in lecture. The number of clicker questions will vary, but will typically be 2 – 4 questions per class period, **beginning with the second class on Wednesday, August 29.**

Clicker questions are presented in multiple-choice format. You may be asked to answer on your own or to discuss possible reasoning with students around you. Sometimes you may be asked a question about a topic you haven't yet encountered in class; often, you'll be asked to apply what you have just learned. ***You should always be prepared to discuss your reasoning for your answer.***

A maximum of **30 grade points** can be earned from clicker questions. Each question answered will earn a student 1 clicker point (for participation). Keep in mind that your ***honest*** and ***best response*** is what will help you AND the instructor—never click in just to click in. You'll learn much more—*even if you're wrong*—if you've given it your best effort. At the end of the semester, a student's clicker points are summed, and increased by 10% to allow for absences, malfunctioning clickers, and all other possible problems. These clicker points are then normalized to a maximum of 30 grade points. For example, if there are 100 clicker questions, there are 100 possible clicker points. If a student has 80 clicker points (including the 10% increase) he/she would receive  $(80/100)*30 = 24$  grade points.

**Register your i>clicker.** Instructions are provided at: <http://oit.colorado.edu/node/779>

### **ALEKS**

ALEKS is an artificial intelligence assessment and learning system. ALEKS uses adaptive questioning to quickly and accurately determine exactly what you know and don't know in General Chemistry and then instructs you on the topics you are most ready to learn. As you work, it periodically reassesses your progress to ensure that topics learned are also retained. ALEKS provides the advantages of one-on-one instruction, 24/7, from virtually any web-based computer, for a fraction of the cost of a human tutor. ALEKS is a modern, powerful assessment and learning tool that can make your chances of doing well in this course significantly higher. ***You will need to purchase a 6 month (180 day access pass).*** Please see the document: **ALEKS FAQ** for more information on the use of ALEKS in this course.

**ALEKS Course Code: MPCL4-6EG3G**

### **Research Project**

You will engage in a semester-long research project and publicly present your research at an end-of-semester poster session. You will work in groups of 2 or 3, according to your recitations, and will be encouraged to select a research topic from a list provided. At least three recitation periods will be used to provide: context for the projects, guidance on how to ask questions about a particular topic, education on how to identify appropriate resources and references, and training in how to create an effective poster. We will provide a list of research topics in order provide guidance and structure to the activity. More than one group will be allowed to select a particular research topic. Student groups will also be permitted to brainstorm their

own idea, in consultation with their TA, Professor Palmer or Professor Parson. Please see the document **Research Project FAQ** for more information.

### **Recitation**

The recitation is an integral and required component of the course. Recitations meet on Thurs each week for 50 minutes. Recitation sessions will focus on conceptual understanding and problem solving. You will work in small groups, and your Teaching and Learning Assistants will help facilitate productive discussions among you and your classmates. Research shows that this model of collaborative learning helps students solidify their understanding of important concepts. You must download and print the recitation worksheet posted on D2L and complete the pre-recitation assignment prior to recitation. Each recitation is worth 6 points and there will be no make-ups. You will be graded based on completion of the pre-recitation questions and active participation during recitation period.

### **Exams and Final Exam**

There will be three examinations and a final examination for this course. The dates, times, and locations are listed below. ***You must be available for these exam times.***

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Help Session	Mon.	Sept	17	6:00 pm	HUMN 150
<b>First Exam</b>	<b>Tues.</b>	<b>Sept</b>	<b>18</b>	<b>6:00 pm</b>	<b>HUMN 1B50</b>
Help Session	Mon.	Oct	15	6:00 pm	HUMN 150
<b>Second Exam</b>	<b>Tues.</b>	<b>Oct</b>	<b>16</b>	<b>6:00 pm</b>	<b>HUMN 1B50</b>
Help Session	Mon.	Nov	12	6:00 pm	HUMN 150
<b>Third Exam</b>	<b>Tues.</b>	<b>Nov</b>	<b>13</b>	<b>6:00 pm</b>	<b>HUMN 1B50</b>
<b>Final Exam</b>	<b>Tues</b>	<b>Dec</b>	<b>18</b>	<b>10:30am</b>	<b>TBA</b>

Each student must bring a calculator, a No. 2 pencil, and a good eraser to the exams; some questions may be multiple-choice questions and may be machine graded.

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### **CHEM 1400 Extra Help**

We want you to succeed in this course! The simple truth is that the more you practice solving problems and constructing explanations, the better you will understand and be able to develop these skills on your own. TAs, LAs and your Professors will hold weekly help sessions. The times and locations will be posted on D2L in the 2<sup>nd</sup> week of class. ***We strongly encourage you to seek out help from TAs, LAs, and your Professors!***

### **Grading**

The overall course grade will be determined as follows:

Exam 1, 2, 3 (@100 pts each)	300
Final Exam	200
ALEKS Homework	150
ALEKS Summer skills review	20
Research Project	130
Video quizzes	80
Clicker questions	30
Recitation	84
Class Surveys	6
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Total	1,000

**Extra credit:** There may be periodic opportunities for earning extra credit (up to ~ 10 points) during the semester so pay close attention to announcements made in class and on D2L.

**Surveys:** We use surveys to help us understand your attitudes and beliefs about Chemistry and to improve the class for future generations. 2 Surveys (CLASS-CHEM and IILSI) will be administered at the beginning and end of the class. Please see the **Summary of Surveys** document on D2L for more information.

**Class engagement:** We reserve the right to subtract 5 points from your final total grade if you fail to observe classroom policy of being on task and if you engage in non-course related technology use.

#### **Final Letter Grade**

Final letter grades for the course will be assigned using the following point scale (+ or – grades will be assigned):

A	900–1000
B	800–899
C	700–799
D	600–699
F	599 and below

### **Tutoring**

The Department of Chemistry and Biochemistry has a list of graduate and other students who are willing to tutor. This list can be obtained in the Undergraduate Office, Ekeley M199.

When you have read this syllabus, please email the name of your hometown to Professor Palmer at [amy.palmer@colorado.edu](mailto:amy.palmer@colorado.edu) for 2 extra credit points.

## **University Policies and Registration Schedule**

### **Accommodation for Disabilities**

If you qualify for accommodations because of a disability, please submit to your professor a letter from Disability Services in a timely manner (for exam accommodations provide your letter at least one week prior to the exam) so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities. Contact Disability Services at 303-492-8671 or by e-mail at [dsinfo@colorado.edu](mailto:dsinfo@colorado.edu). If you have a temporary medical condition or injury, see [Temporary Injuries](#) guidelines under the Quick Links at the [Disability Services website](#) and discuss your needs with your professor.

### **Religious Obligations**

Campus policy regarding religious observances requires that faculty make every effort to reasonably and fairly deal with all students who, because of religious obligations have conflicts with scheduled exams, labs, etc. In this class, students should notify Anne McWilliams (Ekeley M199) of the conflict as early in the semester as possible. An excused absence for religious obligations will be made up according to class policies.

See the [campus policy regarding religious observances](#) for full details.

### **Classroom Behavior**

Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, color, culture, religion, creed, politics, veteran's status, sexual orientation, gender, gender identity and gender expression, age, disability, and nationalities. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. For more information, see the policies on [classroom behavior](#) and [the student code](#).

### **Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation**

The University of Colorado Boulder (CU Boulder) is committed to maintaining a positive learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct, discrimination, harassment or related retaliation against or by any employee or student. CU's Sexual Misconduct Policy prohibits sexual assault, sexual exploitation, sexual harassment, intimate partner abuse (dating or domestic violence), stalking or related retaliation. CU Boulder's Discrimination and Harassment Policy prohibits discrimination, harassment or related retaliation based on race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. Individuals who believe they have been subject to misconduct under either policy should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127. Information about the OIEC, the above referenced policies, and the

campus resources available to assist individuals regarding sexual misconduct, discrimination, harassment or related retaliation can be found at the [OIEC website](#).

### **Honor Code**

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the [academic integrity policy](#) of the institution. Violations of the policy may include: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access, clicker fraud, resubmission, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code Council ([honor@colorado.edu](mailto:honor@colorado.edu); 303-735-2273). Students who are found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code Council as well as academic sanctions from the faculty member. Additional information regarding the academic integrity policy can be found at [honorcode.colorado.edu](http://honorcode.colorado.edu).

***In CHEM 1400, cheating will result in a score of zero on the exam or assignment. All incidents will be reported to the Honor Code Council.***

### **Incompletes**

#### **Incompletes**

Incomplete will be given only for work missed “due to circumstance clearly beyond the student’s control” (i.e., illness, incapacitating accident, death in immediate family, etc.), and only when the bulk of the course has been completed. Students are responsible for supplying appropriate documentation for their absence. After reaching an agreement for an Incomplete with Prof. Palmer or Prof. Parson, the form documenting the work to be made up can be obtained in the Undergraduate Office (Ekeley M199). All Incompletes must be made up within one calendar year from the semester in which it was granted.