TENTATIVE COURSE SYLLABUS
Chemistry 163 Spring Semester 2023

Iowa State University Catalog: Chem 163. College Chemistry. *(4-0) Cr. 4. F.S. Pre-req:* ***1 year of high school algebra and geometry*** *and* ***Chem 50, or 1 year of high school chemistry****; and credit or enrollment in CHEM 163L A general survey of chemistry with an emphasis on conceptual problems for those who are not physical and biological science or engineering majors. Nomenclature, chemical reactions, stoichiometry, atomic structure, periodic properties, chemical bonding, states of matter, solutions, thermochemistry, acid-base theory, oxidation-reduction reactions, basic chemical kinetics, and chemical equilibrium. Only one of Chem 163, 167, 177, or 201 may count toward graduation.* ***Dr. Kathy Burke (kbrk@iastate.edu) is the instructor for Chemistry 163, the lecture component of the course. She or her head TA, Eunbyeol Adamson (Eunbyeol@iastate.edu), can answer your lecture-related questions.***

Chem 163L. Laboratory in College Chemistry. *1 Cr. Pre-req: Credit or enrollment for credit in 163. Laboratory to accompany 163.* ***MUST BE TAKEN WITH 163.*** *Only one of Chem 163L, 167L, and 177L may count toward graduation.* ***Dr. Sara Pistolesi (sarachem@iastate.edu) is the instructor for Chemistry 163L, the laboratory component of the course.*** There is a ***separate*** syllabus for Chemistry 163L. ***Dr. Pistolesi or her head TA, Tianyi Zhang (ztianyi@iastate.edu), can answer your laboratory-related questions.***

College Learning Philosophy: Have you learned a skill like dancing, gymnastics, glassblowing, playing an instrument, video gaming, or playing a sport? You can learn *about* a skill, but you must ***PRACTICE*** to become better at the skill. If you have watched any television programming about Olympic athletes, you have seen how much time they have practiced to become top contenders for medals in their sport(s). Learning is an individual and a personal thing. No one can learn ***FOR*** you. You, alone, are responsible for learning a skill or a concept. ***No one can MAKE you learn!*** You cannot attend a lecture, have the knowledge poured into your brain, and voilá, you have learned the material!

You are the active participant in your own learning. You must become involved from the outset! In this course, it is you who must build the concepts of chemistry one by one to create a strong foundation for later in this course, later in other courses. If you merely sit back and watch, you will not derive maximum value from the course. You will struggle during the chemistry course(s) you take after Chemistry 163. You are in control of whether you learn or not. Helpful and considerate teaching assistants and instructors can make your job a little easier, but they are not responsible for your learning – you are. Most of you are taking Chemistry 163 (a) because it is required and (b) in order to be successful in your next chemistry course that requires Chemistry 163/163L. Let your teaching team help you to achieve that success!

Your Chem 163 team members have planned what they believe will be a beneficial course of study for you. We hope that you will learn to appreciate a little of the wonder of chemistry that brought each of us to the field and that you will have fun along the way—with your peers, your teaching assistants, and your instructor.

Your Instructor:	Dr. Kathy Burke
Office:	3760 Gilman Hall
Office Phone:	515-294-7718 (with voice mail)
E-Mail Address:	kbrk@iastate.edu (Since I have students in ***TWO*** separate courses, please ALWAYS use "Subject: Chemistry 163 AND ***your recitation section #***")
***Office Hours:**	*Mon., 9:40 a.m. (not on exam days); Fri., 9:40 a.m., lower level Troxel Hall; others by appointment
***E-Mail Office Hours:**	*Mon., Tues., Wed., Thurs. 5:00-6:00 pm *some weeks these hours may change due to scheduling conflicts
TA team	Our course team includes teaching assistants whose names, contact information, recitation section assignment, and help center hour(s) are shown on the next page.
Electronic Devices:	When you walk in the door for class (lecture, recitation, or laboratory), please remove your head phones and ear buds. Most days we will not need our smart phones during lecture. For your own benefit, we encourage you to place ***all electronic devices*** in your book bag, backpack, or purse. This includes computers, cell phones, PDAs, beepers, iPads, iPods, or texting devices. You WILL, however, regularly be asked to use your non-programmable calculator.
WWW Address:	http://courses.chem.iastate.edu/

Course Meeting Times

Formal Instruction:	Monday, Wednesday, and Friday at 8:50 a.m.	Room 1001 Troxel Hall
Recitation:	Thursdays— hours vary by student schedule	Gilman Hall
***Laboratory:**	Days/hours vary by student schedule	0284 or 0652 Gilman Hall

IMPORTANT TO NOTE: Chem 163 and 163L are ***co-requisite*** courses. This means that ***students in Chem 163 are required to take Chem 163L at the same time or to have already received credit in 163L***. Co-requisite course requirements are strictly enforced! Students who do not meet the co-requisite should drop the course or **they will receive an F in the course.** Students who drop or audit Chem 163 will be required to drop 163L and vice versa. Students who have previously successfully passed Chemistry 163L are not

required to take it again in conjunction with repeating the lecture component of Chemistry 163. Your advisor can help you to add the laboratory component of the course if you need to do so. If you have questions, please ask!

***PREREQUISITE SKILLS*:** As noted in the university catalog description of the course, **students in Chem 163 should have had basic high school chemistry AND an arithmetic and algebra course in preparation for the mathematics in this curriculum.** Past experience shows that students who do not have these prerequisite skills are more challenged to succeed than students who do. Although there will be mathematics review as we progress through the course, you should have had some exposure to and a comfort level with basic mathematics prior to beginning this course. You will be doing calculations involving fractions, percent, exponents, scientific notation, logarithms, writing and solving algebraic equations, and general algebraic problem-solving techniques.

Audit. Students may not register to audit Chem 163 after 5:00 PM on ***Monday, January 23, 2023***. The audit does not count towards full-time student status. To add or drop recitation or lab sections during the first week of class, use AccessPlus. After the first week, please go to the Undergraduate Chemistry Office in 1608 Gilman (M-F 8 − 12 noon and 1 – 4 pm).

The last day to drop CHEM 163. The last day to drop CHEM 163 is ***Friday March 31, 2023***.

***Your TA Team Information —50-minute recitation section times, locations, and TA information**

Section	Time	Building, Room	Teaching Assistant	Teaching Assistant e-mail Address	TA Help Center Hours
Head TA	—	—	Eunbyeol Gi	eunbyeol@iastate.edu	R 11 a.m.
2	7:45-8:35 a.m.	1813 Gilman	Iqtidar Hussain	ihussain@iastate.edu	W 3 p.m.
3	8:50-9:40 a.m.	1811 Gilman	Simin Sun	simins@iastate.edu	F 11 a.m.
4	8:50-9:40 a.m.	1813 Gilman	Hark Karkee	hkarkee@iastate.edu	R 1 p.m.
5	9:55-10:45 a.m.	1813 Gilman	Eunbyeol Gi	eunbyeol@iastate.edu	R 11 p.m.
6	9:55-10:45 a.m.	1811 Gilman	Baboucarr Faal	bfaal@iastate.edu	W 10 a.m.
7	9:55-10:45 a.m.	1805 Gilman	Iqtidar Hussain	ihussain@iastate.edu	W 3 p.m
8	11:00-11:50 a.m.	1813 Gilman	Hark Karkee	hkarkee@iastate.edu	R 1 p.m.
9	11:00-11:50 a.m.	1801 Gilman	Fatema Hafiz	fhhafiz@iastate.edu	R 9 a.m.
10	12:05-12:55 p.m.	1801 Gilman	Fatema Hafiz	fhhafiz@iastate.edu	R 9 a.m.
11	12:05-12:55 p.m.	1811 Gilman	Benjamin Schelske	bschelsk@iastate.edu	W 2 p.m.
12	1:10-2:00 p.m.	1805 Gilman	Benjamin Schelske	bschelsk@iastate.edu	W 2 p.m.
13	1:10-2:00 p.m.	1114 Gilman	Jonathan Nederhoff	jnndrhff@iastate.edu	W 1 p.m.
14	2:15-3:05 p.m.	1811 Gilman	Jonathan Nederhoff	jnndrhff@iastate.edu	W 1 p.m.

Our Chemistry 163 TA Team

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<td>name: Baboucarr Faal
email: bfaal@iastate.edu</td>
<td>name: Eunbyeol Gi
email: eunbyeol@iastate.edu</td>
<td>name: Fatema Hafiz
email: fhhafiz@iastate.edu</td>
<td>name: Iqtidar Hussain
email: ihussain@iastate.edu</td>
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<td>Head TA for Chemistry 163, s-5</td>
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<td>name: Jonathan Nederhoff
email: jnndrhff@iastate.edu</td>
<td>name: Benjamin Schelske
email: bschelsk@iastate.edu</td>
<td>name: Simin Sun
email: simins@iastate.edu</td>
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COURSE MATERIALS

1. TEXTBOOK REQUIRED: "*Introductory Chemistry*" 5th ed. by Russo and Silver, ISBN: 978-0-321-92711-8

2. CALCULATOR REQUIRED: A ***NONPROGRAMMABLE*** calculator. **During Chem 163, no *programmable* calculators will be needed or allowed on quizzes, hour exams, or the final exam. You may NOT use your cell phone as a calculator at any time during quizzes, hour exams, or the final exam.**

Please borrow or purchase an inexpensive nonprogrammable ***SCIENTIFIC*** calculator to use for doing your homework and in-class practice problems. If you do not already have a nonprogrammable calculator, you can find one for less than $10 at the local discount chain stores. Look for a basic ***SCIENTIFIC*** calculator model that features an EE or EXP or 10^x key option ***DIRECTLY ON THE KEYBOARD***. For future chemistry classes, the functions log x, e^x, 10^x, y^x may also be useful. Some popular brands that are sold locally are listed below. If you need it, please ask your instructor or TA for advice about choosing a calculator.

Some popular nonprogrammable calculators

brand	model number
Texas Instruments	*TI-30Xa
Casio	*fx-260 solar II
Texas Instruments	TI-30XIIS
Casio	fx-350MS

*** most user-friendly models (easiest to use, fewest key strokes to be useful)**

All calculators are subject to inspection during exams and quizzes. If you are unsure about whether your calculator is acceptable, please ask your instructor or your teaching assistant. Please do this in advance to an exam or quiz so that you will have the calculator you are used to using to solve problems.

3. OPTIONAL SUPPORT MATERIALS (AVAILABLE, NOT REQUIRED): Solutions Manual, Math Survival Guide: Tips and Tricks for Science Students, Appling and Richardson, (2nd Ed.), John Wiley; 2004. These are on reserve at the Parks Library.

PARKS LIBRARY: The textbook, solutions to all text problems, and support materials are on reserve at the Circulation Desk located in Parks Library. For reserve items, please see: http://www.lib.iastate.edu/courses-startform/6736.

LAPTOP/iPad USE DURING CLASS: Research in the area of university education have shown that using a laptop or iPad to take notes during lecture may distract you, as learner, as well as those around you. Rather than ask you not to use your laptop or iPad during class, we do ask those using a laptop or iPad to sit in a designated area to minimize distraction to those around you. Eunbyeol, our Head TA for the course, will show you where that area is on the first day.

CELL PHONE/TEXTING COURTESY/ DISTRACTIONS: ***For you and your classmates to be most successful during class time, all electronic devices*** should be put away in your book bag, pocket, or purse during class time (during recitation, lecture, and laboratory). Browsing the Internet, playing games, music, movies, texting, messaging, Facebooking, twittering, reading newspapers, solving crosswords, etc. are all tasks that will distract you from effectively engaging with course material.

Please silence your cell phone. **To monitor the time, there is a clock on the north wall of the classroom (right side as you face the front).**

Please respect all class members—that includes peers, teaching assistants, and your instructor. Any disruptive behavior/activities in the class that might affect your fellow students will not be tolerated and may result in a zero grade for any assignment associated with that class including exams and may impact your grade significantly.

q163: If you have a question about general mechanics of the course, please check the syllabus and the FAQ file in Canvas first. If the syllabus and the FAQ file do not address your question, please send it to "q163". Our head TA, Eunbyeol, will answer it or forward it to me. ***IN THE SUBJECT LINE, PLEASE ALWAYS INCLUDE 163 AND YOUR RECITATION SECTION NUMBER***.

Echo360 video captures: Each lecture is video captured. The video capture provides you with an audio/video record of what your instructor displayed on the overhead camera and any demonstrations captured by the classroom demonstration video equipment. Each video capture file will be posted by date to Canvas later in the day after lecture has finished (usually about 90 minutes later). The link is found on the main menu for your Canvas Chemistry 163 dashboard and is denoted Echo360.

Students have found video capture files useful in the event they have had to miss all or a part of a lecture or simply would like to re-listen to the lecture discussion about a topic. NOTE: The lecture capture does not capture discussions students have during class. ***Please alert me or Eunbyeol if there appear to be any issues with file availability or in audio or video quality.*** (Although we cannot adjust the settings, we can report any problems to a technician who can.)

COURSE INFORMATION:
CHEM 163 WEB SITE: This web site is where you can find the course syllabus online. Other study aids may also be posted there.

http://courses.chem.iastate.edu/

CANVAS FOR CHEM 163: Canvas Menu
a. Echo360: Each lecture is video captured for your later use and filed by date. If you must miss a lecture, you can review the lecture capture. If you would like to watch any part of the lecture again, you can review the file.

b. Files: You will find almost anything for the course posted in the "Files" area of Canvas. Please explore the files area of Canvas so that you have a general idea what you can find there.

When you connect to Canvas, you will find ***File*** folders for or links to…

1. The course syllabus
2. Pre-class notes (basically pre-class (beginning of class) announcements) (posted by date)
3. Chapter notes (printed skeleton version of instructor notes to which you can add your own notes) (posted by date)
4. Post-lecture notes (copy of what the instructor has said during lecture) (posted by date)
5. Quizzes (including sub files: quiz review topics/concepts, blank copies of and an answer key to each quiz (once taken))
6. Pre-exam Problem Sets (PEPS) and eventually, keys to each PEPS (once submitted)
7. Exams (exam review topics, notes for optional exam review sessions, blank copies of and an answer key for each exam (once taken))
8. Exam wrappers (a different one for each exam)
9. Photos of the teaching assistant team
10. Schedule for the Martha E. Russell Chemistry Help Center, 1761 Gilman, with Chemistry 163 teaching team highlighted
11. List of concepts to review for the comprehensive final exam
12. Some homework handouts

c. Modules

1. Dr. Jacob Petrich Chemistry 163 course videos. Dr. Petrich created videos for Chemistry 163 when it was online during fall 2020 and spring 2021.
   Please take advantage of reviewing these tapes for topics you would like to hear explained again or in an alternate way.
2. I-Pad videos about select course topics. For some topics, there are i-Pad videos that explain the concept more in depth and provide extra practice problems. We will point them out to you as we go along. Please review these to see whether they help you!

d. Quizzes—online post-lecture quizzes

1. Each lecture day (except exam days), you will take a short post-lecture quiz.
2. Quizzes will be available from 11:59 a.m. to 11:59 p.m. that day.
3. NOTE: These online post-lecture quizzes are different from the weekly in-person quizzes that you will take during recitation.

CANVAS GRADE CENTER FOR CHEM 163: We will post up-to-date information about course-wide announcements, assignments, quizzes, review sheets, and examinations on the CANVAS site in the Files section. You can check the Canvas grade book for grade information as it becomes available. Grades will be updated weekly by Thursday.

IMPORTANT COURSE POLICY: It is your responsibility to check grades on Canvas. If you discover an error in a grade on Canvas, please show the graded work to your teaching assistant ***WITHIN ONE WEEK*** of receiving the returned graded work to have the grade corrected. It is a good idea to save your graded work.

EXAMINATIONS/QUIZZES:
EXAMINATIONS:
a. ***Hour Examinations.*** There will be four examinations (100 points each) and a ***comprehensive*** final exam (100 points) given on the dates listed below. *Please note the day and time of the FINAL EXAM is already scheduled (it **CANNOT** be changed) and make your end-of-semester travel plans accordingly.* Exams will be taken during class time (8:50 - 9:40 a.m.) and returned at the next recitation session after they are graded.

Exam 1: Monday, Feb. 6
Exam 2: Monday, Mar. 6
Optional replacement exam: Monday, May 1 during Preparation Week. **(This is the only time this exam will be given.)**

Exam 3: Monday, Apr. 3
Exam 4: Monday, Apr. 24
Final Exam: Tues. May 9: 7:30-9:30 a.m.
(This is the only time this exam will be given.)

The four one-hour exams (100 points each) will be given at 8:50 - 9:40 a.m. in 1001 Troxel Hall (or a room your TA will announce to you) on the dates listed above. A class meets in the room prior to our class and directly following our class. ***Please be prompt. We have only 50 minutes for the exams! If you arrive late, you have that much LESS time to complete the exam. We have no way to provide you extra time to take an exam unless you have an official university student academic accommodation notification letter that you have discussed with your instructor at least FOUR business days in advance to the exam.***

The hour exams will be a combination of the following question types: multiple choice, fill in the blank, matching, "explain your idea", and "show your work". Although each exam is worth 100 points, the number and type of questions varies with each exam. This type of format has been chosen in order to award some portion of full credit (called partial credit) for partially correct responses.

THERE WILL BE NO MAKE-UP HOUR EXAMS.

b. ***Optional Replacement Exam, ORE*****.** This exam is optional. If you do not decide to take it, you do not have to attend class this day.

1. ***In case of absence***. Any unexcused absence from an exam results in a score of zero. However, we realize that life happens. If you miss ONE exam due to unanticipated inclement weather, a family emergency, or personal illness, at the end of the semester (Monday, May 1), you will be able to make up the missing points by ***taking an optional replacement exam, ORE, over the material on exams 1-4***. It is comprehensive over the same material as you were tested over in exams 1-4. There are 25 questions, roughly six questions per each of the four original exams. Questions covers the same material as was tested in the original exams but are not the same questions. You have the option to replace ***ONLY ONE*** missing exam score by taking the optional replacement exam.

2. ***Low exam score.*** Any of us can have a bad day taking an exam. If you have taken ***ALL FOUR*** one-hour exams, you have the option of replacing your ***lowest*** exam score with the ***score you receive on the optional replacement exam (ORE), if it is higher than the original hour exam score***. Any ORE score *lower* than an original exam score will not be counted. As explained in part (a), if you miss one of the hour exams, the zero for the missing exam IS your lowest score, and it will be replaced with the percent score that you earn on the optional replacement exam.

c. EXAM WRAPPERS: Each exam we take helps us to learn something, both as we prepare, and as we look at our results. From our graded exam paper, we can use a strategy called an exam wrapper to explore where we did not earn full points and learn from that what we should have learned preparing for the exam. Each time we do this, we learn more, about course material and about how we can improve our exam-taking strategies. For each exam, you will find an exam wrapper posted in the corresponding Exam Wrapper folder on Canvas. The exam wrapper will be due at recitation the week after your graded exam is returned to you.

d. RECITATION QUIZZES: You will take a quiz *EVERY* recitation day. Quizzes will be representative of material discussed during lecture and recitation, with problems similar to homework assignments, pre-exam problem set problems, and exam problems. Each quiz will cover all material specifically since the last quiz or exam, but is considered to be cumulative in nature. This means that you are responsible for all material in the course from the first day. The ***thirteen best*** recitation quizzes will be counted towards your grade. ***There are no make-up recitation quizzes.***

e. POST-LECTURE QUIZZES: For each lecture day, you will take an online quiz worth five points. This quiz will be posted by noon on the same day of the lecture. The post-lecture quiz is due at 11:59 p.m. the same day on which you have lecture (i.e., Monday, Wednesday, and Friday).

The online post-lecture quiz will be posted by 11:59 each lecture day (i.e., about two hours after the lecture ends) and is ***due at 11:59 p.m. that SAME night***. These post-lecture quizzes will comprise 7.5% of your course grade. We will count the best 33 of 39.

f. FINAL EXAM: The final exam will be a 100-point ***COMPREHENSIVE*** multiple-choice examination covering ALL of the material we have studied during the course. **THE *COMPREHENSIVE* FINAL EXAM WILL BE GIVEN Tues. May 9 at 7:30-9:30 a.m. The Registrar sets this time and date.** There will be no possibility to take the final exam at another time. Only those with conflicting final exam sessions or three or more final exams in one day can negotiate any change in the final exam day or time. This is university policy. Please make your summer break travel plans accordingly. ISU final examinations policy will be followed absolutely. (http://www.registrar.iastate.edu/exams/regulations.shtml)

Requests to change final exam day/time: If you want to ask to change the day of the final exam (because of having a final exam conflict or having three or more final exams on the same day), you must make your request to the instructor no later than the last scheduled class day ***before the beginning of Preparation Week*** (this semester that date is Friday, April 28, 2023).

ANY STUDENT WHO MISSES THE FINAL EXAMINATION WILL FAIL THE COURSE.

COURSE PROTOCOL:

GRADES: Your Chem 163 course grade will be based on a total possible 100% as outlined below:

4 one-hour exams—100 pts each	50.0%	Pre-exam problem set (PEPS) scores—10 pts	7.5%	Weekly recitation quiz	
Comprehensive final exam—100 pts	10.0%	Class participation (recitation session) —3 pts	6.25%	scores—10 pts (count best 13)	10.0%
Weekly homework set scores—5 pts	7.5%	(count best 13)	6.25%	Exam wrappers—10 pts	2.5%
		Post-lecture quizzes (online)—5 pts each (count best 33)			

GRADING SCALE:

94 – 100	A	87 – 89.9	B+	76 – 79.9	C+	60 – 64.9	D+	<50	F
90 – 93.9	A-	83 – 86.9	B	69 – 75.9	C	55 – 59.9	D		
		80 – 82.9	B-	65 – 68.9	C-	50 – 54.9	D-		

Knowing your grade at any time: Each week, your TA enters scores for your graded work (i.e., exams, quizzes, and homework assignments) in the Canvas grade book. You can refer to the Canvas grade book to find your grade at any time during the course. Please understand that for any given assignment, it may take your TA about a week to grade your written work and post your score. Graded work is returned at recitation. ***NOTE***: No scores will be "dropped" until after the final exam.

Academic integrity: Demonstrating academic misconduct in any form is in violation of ISU *Student Disciplinary Regulations* and will be dealt with by the Office of Student Conduct. This includes, but is not limited to: copying or sharing answers on tests, quizzes, or assignments, plagiarism, and having someone else do your academic work.

Should you be suspected of academic misconduct, you will be called to the Office of Student conduct to speak with a team member there. Depending on the act, you student could receive an F grade on a test/quiz/assignment, an F grade for the course, and/or could be suspended or expelled from the University. See (http://www.studentconduct.dso.iastate.edu/academic-misconduct) for more details and a full explanation of the Academic Misconduct policies.

*****ATTENDANCE AT LECTURE AND RECITATION:** ***Please respect your instructor and your peers. The ringer on your cell phone/beeper should be turned off during lecture and recitation unless cleared with the instructor prior to class. Please do not text during class or recitation.***

Attendance is required at recitation. Attendance points are awarded. To earn full attendance points, students are expected to be prompt to arrive and to leave the recitation session only when class work is concluded. ***To be able to take the recitation quiz, you must be present for the entire recitation.*** If you have scheduling issues, please discuss them with your instructor.

LECTURE: Each Monday, Wednesday, and Friday, you will attend lecture. During lecture, you will learn about chemistry concepts for which you will complete homework assignments and eventually be quizzed and/or tested.

Please respect your fellow classmates by discussing questions you have in low tones and by not browsing the Internet, playing games, music, movies, texting, Face-booking, twittering, reading newspapers, solving crosswords, etc. in the classroom.

Any disrespectful, disruptive behavior/activities in the class that might affect your fellow students may result in a zero grade for any assignment associated with that class including exams and may impact your grade significantly.

RECITATION: Each Thursday, you will attend a recitation session, selected to fit your own individual class schedule. A teaching assistant (TA), under the guidance of the course instructor, facilitates a 50-minute session during which the TA will often review concepts from the lecture, expand on those concepts as needed, answer your questions about concepts discussed, and carry on a discussion with you about any pertinent chemistry topic(s) you want to explore. Recitations are not meant to be mini lectures. You have the opportunity to ask questions about homework problems or concepts you do not understand. You will take weekly quizzes during recitation.

To be able to take the recitation quiz, it is expected that you will attend the entire recitation.

Points will be awarded for recitation participation; this will be based on how well your TA thinks you are engaging in the class.

3 points: present and actively participating	1 point: present, but not participating
2 points: present and minimally participating	0 point: absent

PLEASE NOTE: If no teaching assistant shows up for your recitation (or laboratory) section, please remain in your classroom and send one student to 1608 Gilman to find a substitute teaching assistant. The department will find a substitute as soon as possible.

If your TA routinely does not arrive ON TIME for your recitation, please alert your instructor and Eunbyeol, the head TA for our course. PLEASE do not wait until midterm, or worse, until the end of the course, to let us know this is happening.

If for any reason you are not able to attend your regular recitation, you can request to attend a different recitation section. If your TA has more than one section and you can attend your own TA's other section, that is the best learning option for you. You can find the times and locations for all of our recitations on page 2 of the syllabus. To arrange to attend a recitation that is different from your own section, please contact Eunbyeol. Please let her know which section you would like to attend. She will contact the TA for that section to find out whether there is an extra seat in the room that day.

HOW YOU CAN FIND HELP IN CHEMISTRY 163:

1. CHEMISTRY HELP CENTER: The Martha E. Russell Chemistry Help Center and Resource Room, located in Room 1761 Gilman Hall, is open M-R from 9 a.m. - 5 p.m. and Fridays from 9 a.m. - 1 p.m. Teaching assistants are available there to answer your questions. Previous hour exams and answer keys for all general chemistry courses are on file there; they are not to be removed from the room. We also have a collection of general chemistry textbooks, study guides, workbooks, etc. for student use. You are encouraged to form study groups and meet regularly in this room. Educational research and common practice indicate that individuals learn best when they have an opportunity to discuss topics and problems with their peers and receive immediate feedback to their questions from TAs on duty there.

2. HELP FROM YOUR CHEM 163 TA: Your own Chem 163 TA has a scheduled student office hour in the Chemistry Help Center. The TA team Chemistry Help Center hours are posted on page 2 of this syllabus.

3. SUPPLEMENTAL INSTRUCTION, SI FOR CHEM 163/163L. Supplemental Instruction (SI) is offered for this course! Our Chem 163 SI leader is Julain. You can contact Julain via the SI website: (https://apps-dso.sws.iastate.edu/si/).

Supplemental Instruction sessions are group study opportunities, scheduled three times per week. These sessions are facilitated by your SI Leader, who attends each lecture class along with you and prepares SI sessions based on the class content. You should attend SI sessions to ask questions about course content and to develop meaningful learning/study strategies and tips. Students who participate in SI sessions typically earn higher final course grades and higher exam scores than students who do not participate in SI. Supplemental Instruction attendance is voluntary, and it is not a substitute for regular class attendance. Session times are scheduled by your SI leader based on your input. For information about the days, times, and locations for Chem 163 SI sessions, please refer to the SI website: www.si.iastate.edu.

4. OPTIONAL HELP SESSIONS BY INSTRUCTOR: On the Sunday afternoon prior to each Monday exam, there will be scheduled ***optional*** study sessions at 2:00-4:00 p.m. in Room 1002 Gilman. At those sessions, I will answer your questions and practice working sample problems with you. These dates (listed by exam number) include:

Exam 1: Sunday, Feb. 5
Exam 2: Sunday, Mar. 5
Exam 3: Sunday, Apr. 2
Exam 4: Sunday, Apr. 23
Optional replacement exam: Sunday, April 30 (this session will be held from 2-4 p.m.)
Final exam: **Sunday, May 7 (2-4 p.m. if students want a review session)

The handwritten notes from each exam review session will be posted in the corresponding exam folder in the Canvas exam file. If you have any difficulties understanding materials studied in class, please take advantage of these help sessions or instructor/TA office hours.

**Based on the schedules and availability of class members, an optional help session will be scheduled for the final exam on Sunday, May 7 (2-4 pm?).

LEARNING OBJECTIVES FOR CHEMISTRY 163:

After successfully completing this course, students will understand:

1. The basic structures of atoms, ions, and molecules, and ways to quantitatively describe the properties of atoms and molecules in the various phases of pure matter and in mixtures.
2. The reactivity of atoms, ions, and molecules, and the various qualitative and quantitative methods for describing, depicting, and balancing chemical reactions.
3. The concept of chemical equilibrium.
4. The concepts of acids and bases.
5. How to correlate the electronic configurations of atoms and the structures of molecules with their chemical properties.
6. How to correctly use the language of chemistry (nomenclature, terminology, and symbolic representations).
7. How to be able to use the periodic table, chemical facts, concepts, and models, and be able to use them as a foundation to organize further chemical knowledge and to understand the physical world.
8. How to be able to visualize the structure of matter and its reactions at the atomic and molecular level.
9. How to master qualitative problem solving skills.
10. How to be able to solve quantitative problems using basic mathematical skills.

COURSE WORK:

ASSIGNMENTS: It is your job/our team job to keep you caught up with the reading and homework in our chemistry course! Getting behind is the number one mistake you can make! Concepts in chemistry are like building blocks. From the beginning of the course, you learn one topic at a time to build up to larger concepts. If you are not confident of a topic early in the course, your whole foundation is unsteady. To avoid this, work to keep caught up every day. It is TOO easy to get behind. If you do small amounts of work each day, that will save you from becoming discouraged later when it is time to complete a major problem assignment or to study for an examination.

HOMEWORK:

Weekly homework: The homework assignments for which you are responsible will be provided chapter by chapter. The homework problems assigned are listed by topic in the order that they will be covered during lecture. This is not necessarily chronological order. It will help your TA in grading if you complete the HW problems in the order they are assigned.

For every one full hour of time that you spend in the classroom, please plan to spend at least an hour and a half to two hours or more studying outside of class. This means that you will spend up to eight hours or more per week actively participating in class and studying for this course. Staying caught up with your assignments will help you to learn the material. If you feel that you are getting behind, please talk with your instructor, your TA, or our SI leader ***as soon as you can*** in order to arrange to get help.

Before coming to class each day, you should skim the reading assignment in the textbook and attempt to work the assigned problems. During each formal "lecture" session, you will be told which problems in the text should be solved for the next class period. Because the homework problems reflect a major portion of the course content, it is essential that you become proficient in solving these

problems. Any questions regarding these homework problems and assigned reading material should be directed to your instructor during the formal "lecture" session, to your teaching assistant during your recitation, to your SI leader, or to TAs on duty in the chemistry help center. These problems will be similar to those problems you will be asked to solve on hour examinations or quizzes.

PRE-EXAMINATION PROBLEM SETS (PEPS)*:** For the Thursday recitation BEFORE each Monday exam, you will complete and hand in a Pre-Examination Problem Set. On the previous Thursday, this PEPS will be posted on Canvas>Files>PEPS>PEPS#. ***Please print out the posted PEPS document and write your answers on that form. Your recitation instructor will explain this in more depth.

A portion of your HW points will be determined by your score on each PEPS. Since your TA will not be able to grade and return your PEPS work prior to the exam, you may wish to scan a copy of your work to compare to the correct answers provided on the PEPS answer key. ***A copy of the PEPS answer key will be posted by noon on the day after you submit your PEPS (Friday before exam).***

Other assigned homework problems are to be worked for your benefit and understanding. The more problems you practice, the more prepared you will be for your exams and quizzes.

Thursdays, at the beginning of recitation class, you will hand in assigned homework problems for grading. The homework problems should be written out on paper and handed in to your TA. Those problems that you will be asked to hand in for grading will be indicated during lecture and via regular Canvas announcements posted by Eunbyeol, our head TA. You should make every effort to work these assigned problems. They are found *at the end of each chapter* in your textbook. The assigned problems reflect the concepts you are expected to understand for the hour exams and quizzes. If you have difficulty with any of them, check your textbook to find where in the chapter the author of the textbook has provided similar example problems. After studying example problems, if you continue to have difficulty you should spend time with (a) your TA during recitation, (b) a TA in the Help Center, (c) your SI leader, or (d) your instructor.

You should show all work that you do to solve a problem, i.e., show HOW you worked the problem. In general, just writing down a numerical answer without showing how you calculated it will not receive points. *The MORE work that you show, the more points you will receive.*

Your recitation instructor (TA) will explain to you what this means along with showing you HOW to show all of your work. Please be certain to ask your TA if you have questions about this requirement.

Your TA will collect your assignment and grade selected homework problems. The graded problems will be returned to you the next recitation class period. Problem sets will be graded for completeness and correctness on the following basis:

0 points = no paper handed in
0.5 point = no work shown, only answers
2 points = less than 50% complete/correct
3 points = 50% complete, showing only minimal work or without demonstrating clear understanding
4 points = 75% complete, showing only minimal work or without demonstrating clear understanding
5 points = complete and correct with all work shown

Unless otherwise noted in the homework assignment section or during lecture, you are responsible for ALL materials in the chapters discussed during class (formal “lecture” or recitation).

Your homework is due *at the beginning of recitation on Thursday*. ***If you submit your homework at the beginning of recitation and it is complete, you have the opportunity to earn an extra 0.25 pt.***

Each student may hand in ONE late homework during the semester. Any other late homework assignment will not be accepted. If you do hand in an assignment late, you should submit it no later than noon on the Friday following the day it is due. This policy is in effect for both end-of-chapter problems as well as for pre-exam problem sets. ***PLEASE NOTE: If you must miss recitation, please scan and send your HW to your TA on the day it is due.*** (Adobe Scan is a free a scanning app for both Android and IOS devices that is useful for this.)

OTHER USEFUL INFORMATION:

Academic success center (ASC): The Academic Success Center, Room 1076 of the Student Services Building, 515-294-6624, provides services and programs to assist students including disability resources, presentations, workshops for study skills. Visit their web site, http://www.dso.iastate.edu/asc/

Special academic needs:

Iowa State University is committed to assuring that all educational activities are free from discrimination and harassment based on disability status. Students requesting accommodations for a documented disability are required to work directly with staff in Student Accessibility Services (SAS) to establish eligibility and learn about related processes before accommodations will be identified. After

eligibility is established, SAS staff will create and issue a Notification Letter for each course listing approved reasonable accommodations. This document will be made available to the student and instructor either electronically or in hard-copy every semester. Students and instructors are encouraged to review contents of the Notification Letters as early in the semester as possible to identify a specific, timely plan to deliver/receive the indicated accommodations. Reasonable accommodations are not retroactive in nature and are not intended to be an unfair advantage. Additional information or assistance is available online at www.sas.dso.iastate.edu, by contacting SAS staff by email at accessibility@iastate.edu, or by calling 515-294-7220. Student Accessibility Services is a unit in the Dean of Students Office located at 1076 Student Services Building.

If you require accommodations, please contact me as soon as you can (***preferably during the first week*** you are enrolled in the course) so that you and I can talk about how we can make appropriate arrangements to meet your needs as soon as possible. **For us to be able to help you for exam or quiz accommodation, our staff has asked that requests be made a minimum of four business days prior.**

Basic needs. To learn effectively, you must have basic security: a roof over your head along with a reliable place to sleep and enough food to eat (view the Food Security at ISU Student Wellness page, https://bit.ly/foodsecurity-isu). If you're having trouble with any of those things, please talk with me or the Dean of Students Office (email studentassistance@iastate.edu, phone 515-294-1020). Together we can work to meet those needs.

Harassment and Discrimination. Iowa State University strives to maintain our campus as a place of work and study for faculty, staff, and students that is free of all forms of prohibited discrimination and harassment based upon race, ethnicity, sex (including sexual assault), pregnancy, color, religion, national origin, physical or mental disability, age, marital status, sexual orientation, gender identity, genetic information, or status as a U.S. veteran. If you have concerns about such behavior, please contact me, Student Assistance (http://www.studentassistance.dso.iastate.edu/) at 515-294-1020, or email dso-sas@iastate.edu, or the Office of Equal Opportunity and Compliance (http://www.eoc.iastate.edu/) at 515-294-7612.

Religious Accommodation. Iowa State University welcomes diversity of religious beliefs and practices, recognizing the contributions differing experiences and viewpoints can bring to the community. There may be times when an academic requirement conflicts with religious observances and practices. If that happens, students may request reasonable accommodation for religious practices. ***In all cases, please put your request in writing***. The instructor will review the situation in an effort to provide a reasonable accommodation when possible to do so without fundamentally altering a course. For students, you should first discuss the conflict and your requested accommodation with your professor at the earliest possible time. You or your instructor may also seek assistance from the Dean of Students Office at 515-294-1020 or the Office of Equal Opportunity at 515-294-7612.

Free Expression: Iowa State University supports and upholds the First Amendment protection of freedom of speech (https://bit.ly/isu-freedomspeech) and the principle of academic freedom (https://bit.ly/regents-academicfreedom) in order to foster a learning environment where open inquiry and the vigorous debate of a diversity of ideas are encouraged. Students will not be penalized for the content or viewpoints of their speech as long as student expression in a class context is germane to the subject matter of the class and conveyed in an appropriate manner.

Public Health: If you are not feeling well, you should stay home and focus on your health. Should you miss class due to illness, it is your responsibility to work with your instructor to arrange for accommodations and to make up coursework, as consistent with the instructor's attendance policy.

Your well-being is important! Iowa State University is committed to proactively facilitating the well being of all students. We welcome and encourage students to contact the following on-campus services for assistance regarding their physical, intellectual, occupational, spiritual, environmental, financial, social, and/or emotional needs:

- Student Wellness call (515) 294-1099 or via website (http://studentwellness.iastate.edu);
- Thielen Student Health Center call (515) 294-5801 (24/7 Medical Advice) or via website (http://www.cyclonehealth.org);
- Student Counseling Services call (515) 294-5056 or via website (https://counseling.iastate.edu);
- Recreation Services call (515) 294-4980 or via website (http://recservices.iastate.edu).

Students dealing with heightened feelings of sadness or hopelessness, thoughts of harm or suicide, or increased anxiety may contact the ISU Crisis Text Line (Text ISU to 741-741) or contact the ISU Police Department (515) 294-4428.

Preparation Week: This class follows the Iowa State University Preparation Week policy as noted in section 10.6.4 of the Faculty Handbook: http://www.provost.iastate.edu/resources/faculty-handbook. As previously noted, there WILL be both a HW assignment and a quiz during Dead Week. Also, the optional replacement exam (ORE) will be administered on Monday of Preparation Week.

Contact Information: If you are experiencing, or have experienced, a problem with any of the above issues, please talk with me. You can also email academicissues@iastate.edu.

Summary of Important Dates:

The **last day for change from credit to audit:** Monday, January 23, 2023. The audit does not count towards full-time student status.

The **last day to drop the course:** Friday, March 31, 2023.

The **last day to change the day of the final exam** (because of having a final exam conflict or having three or more final exams on the same day: Friday, April 28, 2023.

Please see ***Mr. Adam Wade*** in Room 1605 Gilman (amwade@iastate.edu) to negotiate any changes in your status in the course (i.e., drops, etc.). He keeps the computer records for Chem 163/163L.

***TENTATIVE* SCHEDULE**

(Please note that not all chapters are studied and chapters may not be studied in numerical order.)

Chemistry 163s23 tentative schedule for the semester **(Course pace will be adjusted to the class members.)**

week	**laboratory**	**lecture**
1	***Laboratory Check In*** ***Safety Orientation*** ***Introduction to electronic laboratory notebook (ELN)*** ***Safety Assignment 1***	***1/16*** University holiday! No classes! ***1/18*** First day of class! Syllabus, course details discussion ch1 pp. 3-9: matter—definitions pure substances (elements, compounds); mixtures (homogenous, heterogeneous, solutions); chemical formulas *** ***1/19 rec1, q1*** *** ***1/20*** ch1 pp. 10-15; skim 15-21: physical, chemical changes; chemical reactions: reactants —> products
2	***Chemical and Physical Properties*** ***Safety Assignment 2***	***1/23*** ch1 finish ch2 pp. 29-45 precision, accuracy, uncertainty, significant figures; scientific notation; calculations with significant figures and scientific notation; *** ***1/25*** ch2 pp. 45-52 units, metric system, temperature scales and conversions, density concept, density calculations; ***g***iven/***f***ind/***u***se approach to conversions ("gfu") *** ***1/26 rec2, q2, PEPS1 posted*** *** ***1/27*** ch2 pp. 52-65 energy units, energy calculations, q=mcΔT
3	***Chemical and Physical Properties (continued)*** ***Safety Assignment 3***	***1/30*** ch2 finish ch3 pp. 79-97 atomic theory, atomic structure, isotopes, periodic table *** ***2/1*** ch3 pp. 97-109 periodic table, ions *** ***2/2 rec3, q3, PEPS1 due, PEPS1 key posted*** *** ***2/3*** ch3 finish ch4 pp. 121-135 wavelength/energy relationships, electronic structure—electrons moving between main energy levels
4	***Measurements*** ***Safety Assignment 4***	***2/5 Sunday:*** optional help session e1 (1-3 p.m., 1002 Gilman) (session notes posted on Canvas) *** ***2/6*** exam 1 (e1), e1 key posted *** ***2/8*** ch4 pp. 135-142, 150-153 the periodic table as related to energy sublevels, orbitals, and electron configurations *** ***2/9 rec4, q4*** *** ***2/10*** ch4 pp. 142-150 using the periodic table to predict trends (atom size, ionization energy, metallic-ness, reactivity of metals), compound formation
5	***Polymers***	***2/13*** ch4 finish ch5 pp. 167-177 bonding characteristics: ionic, covalent *** ***2/15*** ch5 177-187 Lewis structures for atoms, compounds; AXE notation for Lewis structures, terms associated with Lewis structures (bonding electrons, lone pair, single bonds, double bonds, triple bonds; resonance contributing structures *** ***2/16 rec5, q5, PEPS2 posted*** *** ***2/17*** ch5 pp. 187-192; 192-193 electronegativity, polarity of bonds; naming, writing formulas for binary ionic compounds (cation has only one charge

week	laboratory	lecture
6	***Calorimetry (*q=mcΔT)**	***2/20*** ch5 pp. 194-195 naming/writing formulas for binary ionic compounds (cation has only more than one charge) ("magic 6") ch6 pp. 217-228 Lewis structures, VSEPR, and molecular shape/geometry *** ***2/22*** ch6 pp. 228-236 Lewis structures, VSEPR, and polarity of molecules *** ***2/23 rec6, q6, PEPS2 due, PEPS2 key posted*** *** ***2/24*** ch6 pp. 236-237 intermolecular forces (dipole-dipole forces) ch7 pp. 253-259 phases, intermolecular forces
7	***Practical exam 1 Tasks 1 and 2*** ***(taken from activities weeks 1-6)***	***2/27*** ch7 pp. 262-266; 270-274 more about intermolecular forces *** ***3/1*** ch8 pp. 283-290 reaction terminology, balancing chemical equations *** ***3/2 rec7, q7*** *** ***3/3*** ch8 pp. 290-298 types of reaction, solubility, precipitates, spectator ions, net ionic equations
8	***3-Dimensional structures of molecules (Lewis, polarity)***	***3/5 Sunday:*** optional help session e2 (1-3 p.m., 1002 Gilman) (session notes posted on Canvas) *** ***3/6 e2;*** e2 key posted *** ***3/8*** ch5 200-201 names, formulas for acids ch8 pp. 299-301 acid-base neutralization *** ***3/9 rec8, q8*** *** ***3/10*** ch5 pp. 197-199 names, formulas for ionic compounds with polyatomic ions
	spring break!	***spring break! 3/13-3/17***
9	***Atomic spectroscopy***	***3/20*** ch9 pp.325-333moles and "recipe chemistry" (theoretical yield—stoichiometry) *** ***3/22*** ch9 pp. 334-338 percent yield, limiting reactant *** ***3/23 rec9, q9; PEPS3 posted*** *** ***3/24*** ch9 pp. 334-338 percent yield, limiting reactant
10	***Conservation of matter—copper recovery cycle***	***3/27*** ch9 review recipe chemistry: theoretical yield, percent yield, limiting reactant calculations ch10 oxidation numbers (pp. 370-376) *** ***3/29*** ch10 oxidation numbers; predicting oxidation half reaction, reduction half reaction; identifying oxidizing agent and reducing agent (pp. 363-4; 37-380) (skim pp. 380-383) *** ***3/30 recitation q10; PEPS3 due, PEPS3 key posted*** *** ***3/31*** ch10 activity series pp. 388-393); ch9 molar mass (p. 324); percent by mass composition (pp. 344-345); moles (pp. 319-324)
11	***Oxidation-reduction reactions*** ***Practical exam 2***	***4/2*** Optional review e3 review session 1-3 pm 1002 Gilman *** ***4/3 e3***; e3 key posted *** ***4/5*** ch9 moles and "recipe chemistry" (theoretical yield—stoichiometry) (pp.325-333) *** ***4/6 recitation q11*** *** ***4/7*** ch12 solutions and molarity; molarity and "recipe chemistry" (pp 449-450; 464-469; 476-480)

week	laboratory	lecture
12	***Acid/base titrations***	**4/10** ch12 molarity and "recipe chem" titrations (pp. 480-483) *** **4/12** ch12, ch13 rates of reaction (pp. 514-531) *** **4/13** ***recitation q12; PEPS4 posted*** *** **4/14** ch13 rates and rate law (531-539)
13	***Kinetics*** ***Practical exam 3***	***4/17*** ch13 (pp. 540-545), ch14 equilibrium (pp.560-574) *** ***4/19*** ch14 equilibrium and le Châtelier (pp. 575-581) *** ***4/20 recitation q13; PEPS4 due, key posted*** *** ***4/21*** ch14, ch9 (percent yield, limiting reactant) (pp. 334-338)
14	***Reversible/irreversible processes***	***4/23 optional review session e4 1-3 pm 1002 Gilman*** *** ***4/24 e4***; e4 key posted *** ***4/26*** ch9 (percent yield, limiting reactant); *** ***4/27 recitation q14*** *** ***4/28*** ch9 (percent yield, limiting reactant); ch15 acid/base chemistry (pp. 603-611)
15	***Preparation Week*** ***Laboratory check-out*** ***Attendance is MANDATORY (5-point penalty)***	***4/30 optional replacement exam review session 1-4 pm 1002 Gilman*** *** ***5/1 optional replacement exam during class-if you opt to NOT take the optional exam, you do not have to go to class*** *** ***5/3*** ch15 (pp. 611-615; 615-623; 628-632) *** ***5/4 recitation q15*** *** ***5/5*** ch15 last lecture
16	**Final exam week	5/7 Final exam review session (2-4 p.m.?, location TBA) 5/8 final exam week ***5/9 final exam 7:30-9:30 a.m. same exam rooms (unless your TA informs you differently)***