

CH142, Spring 2020: Lecture Syllabus

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Office hours: open or by appointment

Course webpage: <https://wiki.colby.edu/display/ch142>

Required course materials:

- **Textbook:** Chemistry: The Central Science (13 ed), Brown *et al.*
- **Calculator:** Specified at the bookstore
- **MasteringChemistry access**
- **Laboratory notebook:** Bound (non-carbon copy, non-spiral) notebook

Course objectives and learning goals:

1. For students to deepen their appreciation for the relevance of chemistry, not just as it pertains to scientists, but also as a facet of liberal learning.
2. For students to gain a broad understanding of chemistry that leaves them prepared for organic chemistry and beyond.
 - a. To strengthen communication skills using the nomenclature used by chemists.
 - b. To learn the basic principles of mass balance and chemical equilibria.
 - c. To understand the fundamental kinetics and thermodynamics that govern chemical reactions.
3. For students to sharpen their quantitative skills in a scientific context.
4. For students to improve skills in solving problems that involve the integration and synthesis of new knowledge and to master the interface between narrative and mathematical problem solving.

Grading:

- **Exam 1 (15%)**—Sunday, March 1st from 5:30-7:30 PM in Keyes 105.
- **Exam 2 (15%)**—Tuesday, April 7th from 5:30-7:30 PM in Keyes 105.
- **Exam 3 (15%)**—Monday, May 4th from 5:30-7:30 PM in Keyes 105.
- **Final Exam (20%)**—Cumulative (date, time, and room to be assigned by registrar)
- **Homework (10%)**—Online, via MasteringChemistry
- **Laboratory (25%)**—Attendance is mandatory. You must pass lab to pass CH142. For more information on the Lab, please visit the CH142 webpage.

Lectures meet:

Section A M-W-F — 9:00-9:50 in Keyes 105

Section B M-W-F — 10:00-10:50 in Keyes 105

Anticipated course topics and approximate schedule:

Week of:	Probable topic:	Textbook chapter(s):
2/5	Solution Chemistry	13
2/10	Chemical Kinetics	14
2/17	Reaction Mechanisms and Catalysis	14
2/24	Chemical Equilibria and Le Chatleier's Principle	15
3/2	Weak Acids and Bases	16
3/9	Titrations	16, 17
3/16	Lewis Acid & Bases and Molecular Structure	17
3/23	Spring Break	
3/30	Buffers	17
4/6	Solubility Equilibria & Coordination Chemistry	17, 23
4/13	Thermodynamics	19
4/20	Spontaneity and Gibbs Free Energy	19
4/27	Oxidation-reduction chemistry / Electrochemistry	20
5/4	Electrochemical Cells & Nuclear Chemistry	20, 21

Course policies:

1. Academic Honesty

The Chemistry Department policies regarding exams, attendance, and academic honesty will apply to this course. This information is available on the department website at: <http://www.colby.edu/chem/about/chemistry-attendance-and-exam-policy/>. You are encouraged to study and discuss course material with other students. However, anything you submit for a grade (including online homework and laboratory assignments) must be solely your own work. If you are unsure about the boundaries between collaboration and dishonesty, it is safest to check with Prof. Rice or your laboratory instructor first.

2. Extra help

Please see Prof. Rice as soon as possible if you have any questions about course material. In addition to your professor, help is also available at the Chemistry Help Center, staffed by experienced and knowledgeable chemistry majors, which is open four evenings per week in Keyes 104 (M-Th, 7:30-9:30). These students will be happy to answer questions and help with problems. If you feel the need for further help (*i.e.* after you've tried using the Chemistry Help Center and such), tutors are available — please see Prof. Rice.

3. Exams

There will be three one-hour exams this semester (see dates above) and a final exam during the exam period. Exam questions may come from lecture, lab, the text, and/or homework and will be a mix of short answer and numerical problems. Please note that you must show your work on arithmetical problems for full credit — partial credit is usually available. There will be practice exams available on the course webpage. These practice exams give you additional practice and let you gauge typical lengths of exams, but are not intended to serve as the primary resource for exam preparation. The actual exam will be, at most, only somewhat similar to the

practice exam. Solutions to practice exams will be posted in advance of the exam review sessions, which will be held in class.

There will be no make-up exams. If a student anticipates being away for a College activity on the evening of an exam, Prof. Rice will try to make accommodations, such as having the exam administered by an athletic coach. It is the responsibility of the student to let Prof. Rice know, well in advance, of any potential conflicts and to make the necessary arrangements. Students who suffer a (verified) serious illnesses or family emergency will be excused from the exam. The grade for an exam missed due to an excused absence will be calculated based on performance on the other exams. Accommodations for other, non-college related activities, will not be considered. Should you miss an exam without *verified* medical cause or other prior approval, you shall receive a zero for that exam. Please review the departmental exam policy found on the website: <http://www.colby.edu/chem/about/chemistry-attendance-and-exam-policy/>

Some students may have approval from the Dean of Studies' Office for time extensions on exams. All students, however, will have two hours to complete the one-hour exam. Please speak with Prof. Rice in the first week of class if you have any questions about accommodations for exams or any other aspect of course assessment.

4. Homework assignments

Homework assignments will be administered through MasteringChemistry (see course website for more information). All assignments and deadlines can be found at www.masteringchemistry.com – “Chemistry 142, Spring 2020, Prof. Rice (CH142S2020)”. Homework assignments will collectively count for 10% of your final grade in CH142.

The key to success in this course is to work through lots of problems without looking at an answer key. It is highly recommended that you do “pencil and paper” problems and not just the online problems, given that the exams are completed by hand. End-of-chapter problems will be “assigned” on the course website, but will not be collected or graded. Also, just knowing how to approach a given problem is not necessarily enough. Additional problems may be necessary to reach the point at which completing a set of problems can be accomplished in the context of an examination. Unless you have had extensive exposure to the material already, you will probably need to do more than the assigned problems to succeed in CH142.