Chemistry 3A - Chemical Structure and Reactivity - Fall 2020

Syllabus

General Information
Chemistry 3A is the first semester of a two-semester survey of organic chemistry.

Email
Please use e-mail to ask questions that require a private response, or to make an appointment. Bring course content questions to office hours or post them on Piazza instead of emailing.

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Course Websites

bCourses (asynchronous lessons and gradebook)
Piazza (instructor announcements and student Q&A message board)
Gradescope (quizzes and exams)

Piazza

- **Announcements**: All instructor announcements will be posted on Piazza. You are responsible for making sure that your account on Piazza is active and has appropriate notification options so that you do not miss announcements
- **Asynchronous Q&A**: Students can post "anonymous to peers" but identities will be visible to instructors. This will be heavily moderated by Dr. Robak, treated as "asynchronous office hours".

Textbooks / Supplemental Reading (optional books and other resources)
There is **no required textbook** for this course. A list of supplemental reading recommendations will be posted, primarily from the following sources.

- **Organic Chemistry as a Second Language**: First Semester Topics, 4th Edition, by David Klein (Wiley, ISBN 978-1-119-11066-8)
  This is a small paperback book with review-style descriptions of topics, study suggestions, and many practice problems. The first chapter is available free from the publisher, so you can see if you think it will be useful before you buy it.
- **Master Organic Chemistry** https://www.masterorganicchemistry.com/organic-1/
  This site includes both free and paid resources. Recommended reading links will be free content.
- **Organic Chemistry with a Biological Emphasis**, by Tim Soderberg.
  https://chem.libretexts.org/Bookshelves/Organic_Chemistry/Book%3A_Organic_Chemistry_with_a_Biological_Emphasis_v2.0_(Soderberg)
  A free online textbook
- **CheMagic** https://chemagic.org/molecules/amini.html
  A virtual molecular model kit
- **ChemTube3D** https://www.chemtube3d.com/
  Interactive animations corresponding to many chemistry topics

Office Hours [Zoom]

Description: Office hours are a drop-in, informal, group setting. All office hours are open to all students (NOT restricted to a particular GSI or based on section enrollment). You are highly encouraged to bring questions on a regular basis. In addition, office hours are a great place to review your notes, work on practice problems, and meet other students to study with even if you do not have specific questions before coming.

Schedule: See the course google calendar, posted in bCourses.

Technology Requirements

- Internet access and a computer, tablet, or other device capable of accessing the bCourses and Gradescope websites and using Zoom.

  The Student Technology Equity Program (STEP) may be able to assist you in obtaining the technology needed to be successful in an online course. https://technology.berkeley.edu/STEP. Although the initial program deadline has passed, the site has links to additional technology resources that may be helpful.
- All quizzes and exams in this course will require **handwritten annotation of pdf files** (adding your own structure drawings, curved arrows, labels, etc. to a template/blank file that already contains complex figures.) **It will NOT be possible to complete the course by only writing answers on blank paper.**
  - **Preferred method**: Digital annotation of pdf files.
    - Options for digital annotation hardware include:
      - Touchscreen device and stylus (e.g. iPad, Microsoft Surface, etc.)
      - Screen-free writing tablet that connects to a computer (e.g. Wacom).
    - Options for annotation software include Adobe Acrobat Pro (Berkeley site license) (https://software.berkeley.edu/adobe-creative-cloud),
    - Additional hardware/software recommendations will be posted on Piazza.
  - **Alternative option**: **Print and scan**
    - **Hardware required**: a printer AND a device capable of scanning to pdf. https://gradescope-static-assets.s3.amazonaws.com/help/submitting_hw_guide.pdf
    - **File Quality Requirements**:
      - **Strict file quality requirements** will be enforced for scanned files, including but not limited to the following list. These requirements are necessary due to the grading workflow in Gradescope. Poor quality files can cause >10x the time required for grading, which is not feasible due to GSI workload contracts.
        - Page margins and template images, outline **boxes**, etc. match the original pdf file
        - Image background is white and there are not visible shadows in the image
        - Correct number and order of pages in a single pdf file
        - Answers are written with sufficient ink contrast
        - No image bleed-through is visible from 2-sided printing
        - No watermark (e.g. you cannot use the free version of camscanner)
      - **Scanning Workshops**: To assist you with meeting the file requirements, we will hold scanning workshops during the first week of the semester. **If you are planning to use the print/scan option, you must sign up for and attend one of the workshops**.
- **Synchronous Problem-Solving Sessions** will include many questions that require sharing and discussing drawings within your group (screensharing in Zoom breakout rooms). You are encouraged to use a **digital ink annotation option** for these sessions if possible.

Asynchronous Lessons [bCourses]

Description: 3-6 Lessons per module (per week), designed to be completed in sequential order. Each lesson consists of the following:

Video Lecture: Voice and annotation (screen capture), 15-45 min each. A "fill in the blanks" style lecture notes handout will be provided. Multiple-choice content questions and note-taking prompts are embedded in the videos to allow opportunities for self-assessment of understanding. These questions are not graded for credit.

Self-evaluation: Brief reflection on the concepts covered in the video, to be completed immediately after watching the video. The main focus is on identifying points of confusion for further study. Submitted as a "quiz" in bCourses.

Problem Set: 2-4 pages of written practice problems. An answer key (pdf) will be accessible after submission of the corresponding self-evaluation assignment. These problem sets will not be collected or graded, but these are a critical part of the learning process for this class. Many of these practice problems will be in the same format and at the same level of difficulty as quiz and exam problems. You are responsible for all content covered in these problem sets.

Schedule: Published each Monday 8 am, self-evaluations due at 11:59 pm the following Sunday evening.

Time estimate: (90 - 120 min of video) + (90 - 120 of problem set work) = 180 - 240 min/wk.

Grading: Participation credit, 1 pt per self-evaluation submitted on time.

Synchronous Problem-Solving Sessions [Zoom]

Description: Small group problem-solving in "breakout groups" that are consistent throughout the semester and each have a GSI assigned to them. Problems will be introduced by instructors, time will be allotted for breakout group work, and then answers will be presented by instructors.

(Note: the instructor presentation portion of the sessions will be recorded and posted for asynchronous access, but posting may be delayed by up to 36 hr.)

Schedule: Attend the session corresponding to your lecture section enrollment.

Tuesdays 8:00-9:30 am

Tuesdays 2:00-3:30 pm

Time estimate: 80 min/wk

Grading: ungraded

Summary Assignment (End of Module) [bCourses]

Description: An open-ended opportunity for you to choose the type of studying activity that will help you consolidate your understanding of the concepts from this module. Collaboration with classmates is encouraged.

Schedule: Due at 11:59 pm on Wednesdays.

Time estimate: 30 - 60 min/wk

Grading: Variable number of points, resulting in a total of 8 pt per module of participation credit (including the self-evaluation assignments for each video).

Quiz Notes [bCourses]

Description: Consolidate the information from the module in one page of notes (pdf file) in preparation for the weekly quiz. You may use the file you submitted (and ONLY this file) as a personalized information resource during the weekly quiz. Collaboration with classmates is encouraged.

Schedule: Due at 11:59 pm on Wednesdays.

Time estimate: variable

Grading: This is an optional assignment that is not graded. If you choose not to complete this assignment, you may not use any notes during the quiz.

Quizzes [Gradescope]

Description: One 2-page quiz per module. **Digital handwritten annotation of a pdf file** is required, see the "technology requirements" section of the syllabus.

Schedule: Thursdays during scheduled lecture times. There will be no makeup quizzes. Take the quiz in either section, regardless of your enrollment.

Thursdays 8:15-9:00 am
Thursdays 2:15-3:00 pm

Time limit: 30 min starting from when the quiz assignment is opened by the student on Gradescope.

Grading: 10 pt per quiz, only the best 10 of 13 quizzes count toward the final grade.

Exams [Gradescope]

Description: Three midterm exams and one cumulative final exam. Each midterm is cumulative but emphasizes the most recent four weeks of course content. **Digital handwritten annotation of a pdf file** is required, see the "technology requirements" section of the syllabus.

Schedule: You are responsible for checking the exam dates and times at the start of the semester to make sure that you do have any schedule conflicts. There will be no makeup exams. Any student who misses an exam should contact Dr. Robak immediately to discuss course completion.

Midterm 1: Monday, 9/28/2020, 7-9 pm
Midterm 2: Monday, 10/26/2020, 7-9 pm
Midterm 3: Monday, 11/23/2020, 7-9 pm
Final: Monday, 12/14/2020, 3-6 pm (final exam group 3)

Time limit:

Midterms: 2 hr each *(Exams written at length that would have corresponded to a 1.5 hr in-person exam, but 2 hr of time is permitted to account for technology issues.)*

Final: 3 hr *(Exam written at length that would have corresponded to a 2.5 hr in-person exam, but 3 hr of time is permitted to account for using technology issues.)*

Grading: 100 pt per exam.

Time Zone Accommodations

Students residing in a different time zone may request an alternate schedule for any quizzes or exams that would take place between 10:00 pm and 8:00 am in their local time zone, by submitting the form (located in the "Forms" module on bCourses) at the start of the semester.

Academic Integrity

Each quiz and exam in this class will have specific guidelines listing allowed resources (*e.g. specific websites, documents, and/or personal notes that have been submitted in advance.)*

You **ARE NOT** allowed to use any other resources or to communicate about the questions or content of any quiz or exam with anyone other than Dr. Robak or the Head GSI, directly or indirectly, until after the quiz or exam submission deadline. This includes, but is not limited to the following:

- Viewing websites other than the ones specified in the quiz or exam instructions.
- Talking, emailing, texting, videochatting, using social media, etc.
- Posting and/or viewing posts related to these questions on "tutoring" (Q&A) websites, including but not limited to chegg.com and coursehero.com.

Academic misconduct will be reported to the Center for Student Conduct, with an academic penalty that will include a failing grade in the course.

Letter Grades

Course grades are calculated from the six scores, each with a 100-point maximum, shown below. Your highest five out of six of these scores will be added together to determine your course point total (your lowest score will be dropped).

Description	**Points**
Midterm 1	100
Midterm 2	100
Midterm 3	100
Quizzes *(best 10 out of 13 scores)*	100
Participation *(100 pt cap, with ≥110 pt available)*	100
Final Exam	100
Total *(best **5** out of **6** scores above)*	**500**

Grades in this class are NOT curved. Your score does not depend on the scores of your peers. There is not a limit to the number of students who can earn a particular letter grade. Letter grades will be assigned based on the point total (calculated as described above), using the grade ranges in the table below.

Grade	**Point Range**
A+	480 - 500
A	460 - 479
A-	440 - 459
B+	420 - 439
B	400 - 419
B-	380 - 399
C+	360 - 379
C	320 - 359
C-	280 - 319
D	260 - 279
F	0 - 259

List of Modules (Course Outline)

1. Organic Structure and Bonding
2. Curved Arrow Notation
3. Nomenclature and Conformation
4. Stereochemistry
5. Acids and Bases
6. Nucleophilic Substitution Reactions: S_N2
7. Nucleophilic Substitution Reactions: S_N1
8. Elimination Reactions (E2 and E1)
9. More Reactions with Carbocation Intermediates
10. Reactions of Alkenes
11. Alkenes, Alkynes, and Multistep Synthesis
12. Introduction to Carbonyl Reactivity
13. Radical Reactions

Course Calendar

Mod = Module (all files, lessons, and assignments are posted on Mondays)
AL = Asynchronous Lessons (submit the self evaluations by Sunday nights)
Zoom = Synchronous Problem-Solving Sessions (Tuesdays)
Sum = Summary Assignment and Quiz Notes (due Wed. nights)

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
8/23	8/24 Mod1 posted	8/25	8/26	8/27 First Class (Zoom)	8/28	8/29
8/30 AL1 due	8/31 Mod2 posted	9/1 Zoom1	9/2 Sum1 due	9/3 Quiz1	9/4	9/5
9/6 AL2 due	9/7 Mod3 posted	9/8 Zoom2	9/9 Sum2 due	9/10 Quiz2	9/11	9/12
9/13 AL3 due	9/14 Mod4 posted	9/15 Zoom3	9/16 Sum3 due	9/17 Quiz3	9/18	9/19
9/20 AL4 due	9/21 Mod5 posted	9/22 Zoom4	9/23 Sum4 due	9/24 Quiz4	9/25	9/26
9/27 AL5 due	***9/28*** ***MT1 (7-9 pm)*** Mod6 posted	9/29 Zoom5	9/30 Sum5 due	10/1 Quiz5	10/2	10/3
10/4 AL6 due	10/5 Mod7 posted	10/6 Zoom6	10/7 Sum6 due	10/8 Quiz6	10/9	10/10
10/11 AL7 due	10/12 Mod8 posted	10/13 Zoom7	10/14 Sum7 due	10/15 Quiz7	10/16	10/17
10/18 AL8 due	10/19 Mod9 posted	10/20 Zoom8	10/21 Sum8 due	10/22 Quiz8	10/23	10/24
10/25 AL9 due	***10/26*** ***MT2 (7-9 pm)*** Mod10 posted	10/27 Zoom9	10/28 Sum9 due	10/29 Quiz9	10/30	10/31
11/1 AL10 due	11/2 Mod11 posted	11/3 Zoom10	11/4 Sum10 due	11/5 Quiz10	11/6	11/7
11/8 AL11 due	11/9 Mod12 posted	11/10 Zoom11	11/11 Sum11 due	11/12 Quiz11	11/13	11/14
11/15 AL12 due	11/16 Mod13 posted	11/17 Zoom12	11/18 Sum12 due	11/19 Quiz12	11/20	11/21
11/22	***11/23*** ***MT3 (7-9 pm)***	11/24	11/25	11/26	11/27	11/28
11/29 AL13 due	11/30	12/1 Zoom13	12/2 Sum13 due	12/3 Quiz13	12/4	12/5
12/6	12/7 RRR	12/8 RRR	12/9 RRR	12/10 RRR	12/11 RRR	12/12
12/13	***12/14*** ***Final (3-6 pm)***	12/15	12/16	12/17	12/18	12/19

Students with Disabilities

UC Berkeley is committed to creating a learning environment that meets the needs of its diverse student body including students with disabilities. If you anticipate or experience any barriers to learning in this course, please feel welcome to discuss your concerns with me.

If you have a disability, or think you may have a disability, you can work with the Disabled Students' Program (DSP) to request an official accommodation. The Disabled Students' Program (DSP) is the campus office responsible for authorizing disability-related academic accommodations, in cooperation with the students themselves and their instructors. You can find more information about DSP, including contact information and the application process here: https://dsp.berkeley.edu/.

Students who need academic accommodations or have questions about their accommodations should contact DSP, located at 260 César Chávez Student Center. Students may call 642-0518 (voice), 642-6376 (TTY), or e-mail dsp@berkelely.edu.

If you already have an **accommodation letter from DSP**, please check to make sure that the letter is submitted through the DSP system (there is no need to email a separate copy). Exam accommodations (extended time, etc.) are coordinated by the department scheduler, Sara Russell (sararussell64@berkeley.edu). Please respond promptly to her emails.

If you would like to set up an **individual meeting with me to discuss your accommodations**, please email me (mrobak@berkeley.edu).

How to do well in this class:

- Plan your study time ***strategically*** (don't waste your time and don't fall behind)
- Focus on how individual examples illustrate ***bigger concepts/trends***, be selective about ***memorization***
- Ask and answer lots of ***questions***. Make lots of ***mistakes*** (in writing!)