Chemistry 4B
General Chemistry
Spring 2015

Instructors:	Dr. Michelle Douskey	Professor Jamie Cate
Office Hours	Wednesday 3-4PM and Thursday 2-3PM in 307 Latimer (first 6 weeks only)	TBA 708B Stanley Hall
Email:	douskey@berkeley.edu lecturing the first 7 weeks on quantitative analysis, instrumental methods, and green chemistry	jcate@lbl.gov lecturing the second 7 weeks on kinetics, introductory organic, chemical biology and special topics
Class Meetings	MWF 10:10-11:00 AM in 1 Pimentel Hall	
Required Materials:	Three textbooks are required, plus a laboratory manual (1) Principles of Modern Chemistry, by Oxtoby, Gillis and Campion, 7th edition, Cengage 2012 (2) Quantitative Chemical Analysis, by Harris, 8th edition, Freeman 2010 (3) Custom eBook supplement for chemical biology (4) Lab Manual, available as downloads on bcourses	
Course Website	http://bcourses.berkeley.edu	

EXPECTATIONS: In this course, the main goal is for you to develop your critical thinking skills in chemistry by learning to design an effective experiment to answer a research question. Specifically, we will be building knowledge of chemistry, but also about the scientific process in general.

CLASS ACTIVITES: Class time will consist of lecture, demonstrations, discussions, and group activities/problem solving. Participation in discussion is expected and will maximize your learning. Every Friday there will be an in class discussion called Flipped Friday. Lecture and video content will be available the day before, then in class will be small group work. You will work with students in your own lab section for Flipped Fridays.

bCourses: You can log on to bcourses using your Calnet ID. In addition to posting relevant course information, we will be using bcourses as an online management tool for the grading database. You will be able to check your grades online throughout the semester.

WEEKLY REVIEWS: The GSIs will be hosting weekly review sessions on Tuesdays from 6-7:30PM in 120 Latimer. These sessions will likely focus on the chemistry and report writing of the laboratory portion of the course.

HOMEWORK: Homework will be assigned weekly and graded by your lab GSI. Homework is due when you get to class on Monday, the week after it is assigned. The first homework is due January 26. Each homework assignment will be worth 4 points. The GSIs will spot check four problems, so be sure to attempt to answer all the questions. You must show your own work to receive credit. The week of an exam, homework will be assigned but not graded. These problems will be helpful to you in your studying but not collected. No late homework will be accepted. The lowest homework grade will be dropped before grades are calculated at the end of the semester.

LAB: Detailed information about the laboratory portion of the course can be found on bcourses. There will be eight experiments that span the first ten weeks of the semester. The lab period lasts for 4 hours beginning with a brief prelab discussion facilitated by your GSI. The rest of the lab time will be devoted to performing the experiment and writing up your lab report. In most instances, lab reports are due the week after you complete lab. In some cases we allow an extra week to work around exams. Students must always think for themselves and turn in their own work, even when collaborating with lab partners. Consult the schedule listed on bcourses. Late lab reports will incur a 20% per day penalty. The last six weeks will be devoted to planning and executing a longer research project. Students will work in pairs for their research project. At the end of the semester on Saturday, May 9th, students will present posters on their work. Attendance and completion of all lab experiments is mandatory. If you miss a lab session, you will fail lab and earn no higher than a D for your course grade. If you miss lab due to illness or family emergency, please contact the ISF supervisor, Jeffrey Eummer, to reschedule.

CHEATING AND PLAGIARISM: We expect you to follow the Berkeley Honor Code: "As a member of the UC Berkeley community, I act with honesty, integrity, and respect for others." Incidences of cheating will be taken seriously and paperwork will be filed with the Office of Student Conduct. Resist the temptation to copy answers from solutions manuals.

EXAMS: There will be three midterm exams in this course administered during class on the following dates: February 9, March 2, and March 30. If you cannot be present to take the exams at these times, you cannot take Chem 4B. Exam questions will be taken from material covered in the course from lecture, lab, discussion, demonstrations, and applications. The final exam for this course will be cumulative and will be on Tuesday, May 12th, from 3:00-6:00 PM. More details about the exam policies for Chem 4B can be found on our course website.

GRADING POLICY: The different aspects of the course will be graded as follows.*

	Percent of Grade
Lab	~~30%~~ 35%
Flipped Fridays	5%
Homework (10 HW, 4 pts each)	5%
Exams (3 midterms, 1 final)	55%
Course Total	100%

*Note: these proportions may change slightly during the semester.

OVERALL GRADE FOR THE COURSE:
Your overall grade for the course will be determined by the number of points you earn in the course. The intended grade ranges for the course are listed below. Since we are grading on a straight scale, everyone has the chance to succeed and students are encouraged to help each other to maximize learning. The +/- cutoffs will not be published or released to students (not even at the end of the semester). Grade cutoffs may be lowered in extreme circumstances, but they will not be raised. If you earn greater than 87.5% in this class, you are guaranteed to fall in the 'A' range. For example if you earn 88% of the course points you will earn an A- in the class.

Grade	**Percentage Range**
A	87.5-100
B	75.0-87.4
C	60.0-74.9
D	45.0-59.9
F	<45.0

Unit 1 Syllabus*

Mon	*Tue*	*Wed*	*Thu*	*Fri*	**Weekly Reading (R), Homework (H), and Lab (L)** (*Ox* for Oxtoby and *H* for Harris)
19 Martin Luther King Day	**20**	**21** Course intro and review of 4A concepts	**22**	**23** green chemistry Flipped Friday	**R1:** *H* Ch 0-3 **H1:** *H* 0-2, 0-4, 1-23, 2-15, 3-7, 3-11, 3-13, 3-16 and green chemistry questions posted on bcourses **(due Jan.26)** **L1:** Check In
26 Chemical principles of chromatography	**27**	**28** Complexometric titrations	**29**	**30** Flipped Friday	**R2:** *Ox* Ch 3.6-3.11, 7.1-7.7, 10.1-10.3, 11.2, 11.5; *H* Ch 11, 17, 18, 22 **H2:** *Ox* 3.13, 3.34, 3.64, 10.18, 14.72, 14.105, 20.32 and questions posted on bcourses **(due Feb. 2)** **L2:** Quantitative Analysis of a Solution Containing Co and Cu (separation by chromatography) **Projects:** Two project ideas due
2 Calibration curves	**3**	**4** Atomic and Molecular spectroscopy	**5**	**6** Flipped Friday Exam Review	**R3:** *Ox* Ch 20.1, 20.2, 20.5; *H* Ch 4, 5, 20 **H3:** *Ox* 20.38, 20.39; *H* 17-10, 20-17, 20-21, 20-22, 4-G, 4-17, 4-32 **(not collected but recommended as practice for the exam)** **L3:** Quantitative Analysis of a Solution Containing Co and Cu (analysis of Co by EDTA)
9 **Midterm #1** (in class)	**10**	**11** Interpreting chromatograms, chromatography theory	**12**	**13** Flipped Friday	**R4:** *H* Ch 22, 23, 24 **H4:** *H* 22-18, 22-45, 24-A, 24-D, and library assignment **(due Wed Feb. 16)** **L4:** Quantitative Analysis of a Solution Containing Co and Cu (analysis of Cu by MP-AES) **Projects:** One page outline

*A complete syllabus for the whole semester will be available on the course website as we proceed.