

Chem 271/MCB C212, Spring 2014 – General Information

Course description:

This course will survey current topics in chemical biology research with a focus on concepts and tools from chemistry that are uniquely enabling of biological discovery. Lecture topics will include protein structure, chemistry and engineering strategies; protein profiling and imaging methods; strategies for developing small molecule modulators of protein function; nucleic acid structure and chemistry; modulating nucleic acid function with small molecules; nucleic acid therapeutics; technologies driving genomics and epigenetics research; emerging RNA functions; glycan structure and chemistry; glycotherapeutics. Supplementary reading assignments will be derived from modern research literature. Grading is based on two midterm exams and one final exam, all administered in class (see schedule below). Practice problem sets will be distributed in advance of exams.

In earlier years, the course was deconstructed into three modules (A, B and C) and this structure persists in the course catalog. However, in recent years, integration has been the norm and therefore one should consider this to be a single consolidated course that cannot be deconstructed into separate modules. Therefore, please enroll in all three modules if you have not done so already.

The primary prerequisite for the class is advanced coursework in organic chemistry (e.g., Chem 200 or equivalent). Knowledge of introductory level biochemistry is also helpful (e.g., MCB 102, Chem 135, or equivalent).

Course details:

Professor: Carolyn Bertozzi

Office hours: Wednesday @ 4-5 pm, 820 Latimer, or by appt

Communication with Prof. Bertozzi or GSIs:

bertozzichem271@gmail.com

GSIs: David Spiciarich (dspiciarich@berkeley.edu)

Office hours: **TIME/LOCATION TBD**

Frances Rodriguez-Rivera (frodriguez@berkeley.edu)

Office hours: **TIME/LOCATION TBD**

bspace site: All ppt slides and various course materials will be posted at our bspace site, as well as class announcements so check frequently.

Lectures: Tues, Thurs 9:30-11:00 am, 106 Stanley

Two midterms: In class on **Thurs Feb 20 and Thurs Apr 10**

Final exam: In class on **Thurs May 1**

Grading: Midterms: 300 points each

Final exam: 400 points

Lecture topics in their approximate order

1. Protein structure and chemistry
2. Protein synthesis and engineering
3. Methods for interrogating proteins in biological systems
4. Modulating protein function with small molecules
5. Posttranslational modifications
6. Proteomics
7. Nucleic acid structure and chemistry
8. Nucleic acid synthesis
9. Modulating nucleic acid function with small molecules
10. Nucleic acid therapeutics
11. Genomics and epigenetics
12. Genome engineering
13. Emerging RNA functions
14. Glycan structure and chemistry
15. Glycotherapeutics