

Bioorganic Chemistry (Chem 468/568)

Robinson Hall, Room A106

Tuesday Nights, 4:30-7:10

Instructor: Barney Bishop

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Office Hours: Monday afternoons 3:30-5:00 or by appointment

Recommended Texts: No specific text is recommended. However, Biochemistry and Organic Chemistry texts would provide good supplemental reading for several lectures. Additional reading material from the literature will be recommended throughout the semester.

This course is intended to provide students with a basic understanding of the chemical nature of biomolecules and biomacromolecules. As part of this course, students will be introduced to biomolecules such as amino acids, proteins, carbohydrates and lipids. Specifically, lectures will focus on their biophysical properties, synthesis and modification. Throughout the semester, practical examples and visual aids will be employed in order to emphasize the significance and ramifications of the subject matter.

Goals of this course:

- 1.) Introduce/reintroduce students to amino acids, peptides, proteins and their biochemical and physical properties.
- 2.) Introduce students to the chemistry behind peptide synthesis, peptide mimetics, combinatorial chemistry, protein modification and applications for enzymes in chemical synthesis.
- 3.) Introduce/reintroduce students to carbohydrates and their biochemical properties
- 4.) Introduce students to the chemistry behind carbohydrate chemistry and oligo/polysaccharide chemical synthesis.
- 5.) Introduce students to the relationships between biomolecules and modern materials

The bulk of the material presented in lectures will be drawn from several sources, and where appropriate reference information for primary source material will be given to the students.

Grading and Examination Policy

For students enrolled in **CHEM 468**, grades will be based on:

- Two in-class or take-home exams (02/24 and 04/14) and a non-cumulative final exam. Students are primarily responsible for material covered in the lectures and selected reading material. Each of these exams will contribute equally (25%) to your final grade in the class. A grade of 0 (zero) will be assigned for missed exams.
- Papers will be assigned to be read and then discussed in class. Students will be expected to come to class having read the papers. Class participation and contribution in these discussions will contribute the remaining 25% of your final grade.

For graduate students enrolled in **CHEM 568**, grades for will be based on:

- Two in-class or take-home exams and a final exam as described above for CHEM 468.
- In addition to the exams, each graduate student will present a 20-minute lecture at the end of the semester on a topic from the literature that is relevant to bioorganic chemistry.
- The exams will each contribute 20% of your final grade, the in class presentation 20%, and the participation in class discussions will account for the remaining 20% of your grade for the class.

Note: Please turn off cell phones and beepers in this class.

Week	Date	Topic	In Class	Reading
1	01/20/15	Introduction – amino acids and proteins	Lecture	Lecture Notes (supplement with a general biochem. text)
2	01/27/15	Peptide chemical synthesis	Lecture	Lecture Notes (supplement with organic text)
3	02/03/15	Peptide chemical synthesis (continued)	Lecture	Lecture Notes (supplement with organic text)
4	02/10/15	Peptide Mimetics	Lecture + discussion	Lecture Notes
5	02/17/15	Combinatorial Chemistry	Lecture + discussion	Lecture Notes
6	02/24/15	Test I		Lectures from weeks 1-5
7	03/03/15	1.) Protein/peptide modification & 2.) Enzymes in chemical synthesis	Lecture + discussion	Lecture Notes
8	03/10/15	No Class – Spring Break		
9	03/17/15	1.) Introduction to carbohydrates 2.) Chemical synthesis of oligosaccharides and carbohydrates – part 1	Lecture	Lecture Notes (supplement with general biochem text)
10	03/24/15	1.) Chemical synthesis of oligosaccharides and carbohydrates – part 2 2.) cyclodextrins	Lecture + discussion	Lecture Notes
11	03/31/15	Bio-inspired materials	Lecture + discussion	Lecture Notes
11	04/07/15	Biomolecular interactions with polymers	Lecture + Discussion	Lecture Notes
12	04/14/15	Test II		Lectures from weeks 7-12
13	04/21/15	Student Presentations		
14	04/28/15	Student Presentations		
	05/12/15	Final Exam		4:30-7:15