

Protein Biochemistry / BIOL

PREREQUISITE BIOL2230, BIOL2270, CHEM1212 (from old B.S. curriculum) or BIOL1108, BIOL3200, CHEM1212 (from new B.S. and B.A. curricula) or permission of the instructor

INSTRUCTOR Dr. Theresa Grove
Office: BC 1099
Office hours: Monday 3:00-5:00 p.m. or by appointment

COURSE GOAL AND OBJECTIVE This class is designed to teach you an overview into the structure and function of proteins with emphasis on properties of amino acids, protein folding, protein-protein and protein-ligand interactions, enzyme kinetics, and enzyme regulation. The laboratory component will introduce you to many techniques that are not only used by researchers who study the structure and function of proteins, but by many other scientists in diverse fields of biology such as physiology, molecular and cell biology, population genetics and microbiology. By the end of the semester you will have:

- Gained knowledge of protein structure and function
- Maintained a comprehensive scientific notebook of techniques and results
- Learned experimental techniques used to study protein structure and function
- Strengthened your ability to critically read and understand scientific literature

These goals support the Department of Biology Education

LAB NO EBOO Students must keep a research notebook. It can be a spiral bound notebook or any other type of composition notebook; binders are not allowed. The notebooks must have a table of contents on the first page. During each lab period you will include the date, purpose of the experiment, protocol you follow (fill in as you go along during lab; you cannot paste lab handouts in your notebook), results, and analysis of results. Notebooks are normally not perfectly neat (no recopying after lab). There is no printer in lab, so everyone should either be prepared to email themselves any spreadsheets or graphs or bring a flash drive with them to lab. Data analysis will occur (usually) in lab; bring a calculator to lab. You will be able to use your notebooks for the lab exams.

LEC RE EXAM The dates for the exams are included in the Tentative Class Schedule. Note, that these are TENTATIVE, therefore the professor reserves the right to adjust the dates of the exams. Three exams (excluding the final) will be given throughout the semester. Each exam will be worth 100 points and will consist of a variety of types of questions that will include (but aren't limited to) matching, multiple choice, labeling, fill in the blank, and short answer. During the exam all cell phones must be turned off. Exams will not be handed back.

It is the instructor's prerogative to accept (or not accept) an excuse for a missed exam; therefore, **DO NOT MISS EXAMS!** Make-up exams are available for students with approved reasons, but these exams will be more challenging than the original exam, and the format may also be different (i.e. an oral exam). Students must contact me via email on the day of the exam for approval (**NO PHONE CALLS**) and are required to make-up the exam within 2 days of the missed exam, except under extreme circumstances. The professor reserves the right to not approve a missed exam as well as to require documentation of the reason why the exam is missed. Only students with a University related excuse may take an exam early.

LAB EXAM Two lab exams (50 points each) will be given throughout the semester. These exams will test you over the practical side of protein biochemistry and what you did in lab. These will be open notebook (handouts cannot be used).

F NAL The final will be cumulative and worth 200 points. The date of the final is Wednesday, May 4 (10:15 a.m. -12:15 p.m.). **NO EARLY EXAM - LL BE G EN**

GRAD A E DEN Graduate students will write a 7 page paper on a protein of their choice.

A E MEN	Exams (3 exams; 100 points each)	300 points
	Lab exams (2 exams; 50 points each)	100 points
	Journal Article Presentations	50 points
	Homework and other Assignments	~50 points
	(Graduate Student Paper)	(50 points)
	total Points	Grade Credits

GRADE SCALE For all students, grades will be based on the above assessments. The grading scale I will use is:

EN A ELEC RE C ED LE

n ry

- 11 Introduction and Overview of course
- 13 Chapter 1: Amino Acids (pp. 5-20)
- 18 Amino Acid Structure (cont'd)
- 20 Chapter 2: Noncovalent Interactions (pp. 21-34)
- 27 Chapter 3: Structural Organization of Proteins (pp. 35-57)

Fe r ry

- 1 Structural Organization of Proteins (cont'd)
- 3 Catch-Up and Review
- 8 **E**
- 10 Chapter 4: Biosynthesis of Proteins Biosynthesis of Proteins (pp. 61-80)
- 15 Biosynthesis of Proteins Biosynthesis of Proteins (cont'd)
- 17 Chapter 5: Posttranslational Modifications Review (pp. 81-97)
- 22 Chapter 6: Protein Folding (pp. 101-121)
- 24 Chapter 7: Intracellular Sorting of Proteins (pp. 123-134)

M rch

- 1 Intracellular Sorting of Proteins (cont'd)
- 3 Chapter 8: Protein Turnover (pp. 317-143)
- 8 **E** (This Exam may be pushed back to March 10)
- 10 Chapter 21: Enzymes (pp. 283- 311)
- 15 No class spring break
- 17 No class spring break
- 22 Enzymes (cont'd)
- 24 Chapter 22: Nucleic Acid-Binding Proteins (pp. 313-322)
Chapter 23: Cell Surface Receptors and Signaling (pp. 323-335)