

CHEM 572 Enzyme Reaction Mechanisms Spring 2013

Instructors:

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Class Meeting: M/W/F 9:10-10:00am, Fulmer 432

Required Textbook: Enzymatic Reaction Mechanisms; *Perry A. Frey and Adrian D. Hegeman*; ISBN-10: 0195122585

Course Description: This course will first describe the methods used to determine enzyme reaction mechanisms, and how enzymes catalyze reactions. An overview of cofactors important in enzyme catalyzed reaction will be given, followed by examples of different classes of enzyme catalyzed reactions.

Course Objectives: To familiarize students with enzyme reaction mechanisms, enzyme classes, and modern experimental methods used to study enzyme reaction mechanisms.

Learning Outcomes: Student will be proficient at 1) describing all classes of enzymes including the role of cofactors; 2) writing kinetic equations describing enzyme catalysis; 3) designing experiments that probe enzyme reaction mechanism, and 4) critically interpret the results of these experiments.

Grading Scheme: This course will be graded on the basis of the two halves of the course, each worth 50% of your grade. Two exams will be given one on October 17th and the second during the assigned exam time for the class. While subject to change the exams will be open book and open note.

Grading Scale:

A	90-100	B	80-83	C	70-73	D	60-63
A-	87-89	B-	77-79	C-	67-69	F	<60
B+	84-86	C+	74-76	D+	64-66		

Topic Coverage:

Section 1 (August 25th - October 17th):

1. Enzymes and Catalytic Mechanisms
2. Kinetics of Enzymatic
3. Coenzymes I: Organic Coenzymes
4. Coenzymes II: Metallic Coenzymes
5. Enzyme Inhibition
6. ACYL Group Transfer: Proteases
7. Isomerization
8. Decarboxylation and Carboxylation
9. Addition and Elimination

Section 2 (October 17th- December 12th)

1. Phosphotransfer AND Nucleotidyl Transfer
2. ATP-Dependent Synthetases and Lipases
3. Glycosyl Group Transferases
4. Nitrogen and Sulfur Transferases
5. Carbon-Carbon Condensation and Cleavage
6. Alkyltransferases
7. Oxidoreductases
8. Oxidases and Oxygenases
9. Complex Enzymes

Assessment: Student Learning Outcomes 1-4 will be assessed using hand-graded exams and in class participation. Students will be asked to evaluate data, hypothesize a chemical and kinetic mechanism, and design new experiments to test their hypothesis.

Students with Disabilities:

Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please either visit or call the Access Center (Washington Building 217; 509-335-3417) to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center.

Academic integrity:

Academic integrity will be strongly enforced in this course. Any student caught cheating on any assignment will be given an F grade for the course and will be reported to the Office Student Standards and Accountability. Cheating is defined in the Standards for Student Conduct WAC 504-26-010 (3). It is strongly suggested that you read and understand these definitions: <http://conduct.wsu.edu/default.asp?PageID=338>

Safety Statement:

The following websites detail the WSU Safety policy and plan. The content of these sites will be discussed on the first day of the term

- <http://safetyplan.wsu.edu>
- <http://alert.wsu.edu>
- <http://oem.wsu.edu>