

Chem 4540 Winter 2005 Course Review and Final Format

Final Exam: Thu, April 14

8:30 – 10:30 am in MacKinnon 234

Section I

- Role of enzymes as catalysts
 - Physical and chemical role
 - Thermodynamics and kinetics
- Enzyme nomenclature
- Enzyme assays
 - Types (enzyme or substrate concentration, continuous or discontinuous)
 - conditions
 - How to measure and quantify activity (units, katal, etc.)
 - Practical considerations

Section II

- Enzyme kinetics
 - Derivation
 - Graphical analysis
 - Practical aspects for measuring
- Enzyme inhibition
 - Different types
 - Calculation of K_i values
 - Graphical analysis
- Multisubstrate reactions
 - Cleland convention
 - Reaction types
- Substrate binding
 - Derivation of one and two site models
 - Calculation of binding constants
 - Methodology for determination of binding constants

Section III

- Types of reaction mechanisms (Acid/base, electrostatic, metal ion, etc.)
- Active site investigation
 - Role of kinetic investigations
 - Detection of intermediates
 - Role of X-ray crystallography
 - Chemical modification reactions and applications
 - Enzyme engineering and design
- Specific enzymes
 - Case studies 1 – 4
 - Know and draw reaction and mechanism
 - General details concerning structure and catalytic features, including important catalytic residues
 - Enzyme's role in the cell and /or physiology

Additional Points

- You should be able to answer any of the question from Problems Sets 1 – 5
- Useful to remember a specific example (if applicable) for many of the principles discussed throughout the course
 - The example can be one given in the lecture notes or written on the board in class **or** from your personal reading or experience

Format for the Final Examination for Chem 4540 Enzymology
(W'05)

1. The final is **cumulative** and includes all the material discussed in class, the 5 problem sets, and the course notes, but **not** the laboratory component of the course.
2. The examination will be closed book. You will need a pen, a ruler, and a calculator.
3. The final exam will be 2 hours (120 min) in duration and will be administered in **MacK234 on Thursday, April 14, 2005 from 8:30 am – 10:30 am.**
4. Part A: Six (6) questions that require a definition, each worth 2 marks (total = 12 marks).
5. Part B: Six (6) short answer questions similar to previous quiz style and format (2 marks each, total = 12 marks).
6. Part C: Four (4) calculation questions worth 3 marks each (total = 12 marks).
7. Part D: Two questions (multiple part) about the Case Study Enzymes worth 3 marks each (total = 6 marks).
8. The total marks for the final examination is 42.
9. The examination is worth 35% of your final mark for the course.