

Chemistry 447H1 / 1006HS Course Information Spring 2020

Lecturer

Professor Mark Nitz
Lash Miller Laboratories Rm. 459
mark.nitz@utoronto.ca

Course Description

This course focuses on understanding the binding interactions and catalysis which drive biological systems.

Textbook

There is no required textbook for the course. Voet and Voet Biochemistry as well as Kuriyan Konforti and Wemmer “The Molecules of Life” are useful references. In addition primary literature will be used extensively in the course

Lectures

Lectures meet Tuesday and Thursday 10-11am in UC 152.

Most of the course notes will be available on Quercus. Make every effort to attend all lectures since it is here that the fundamental content of the course will be presented.

Office hours

One hour following lectures on Tuesday either in the lecture room or lecturer’s office, alternate times can be arranged by email appointment.

Date:	Material Covered	Suggested Readings
Jan 7 th	Intro to course: Goals of Biological Chemistry, influenza. Binding interactions and K_D , coupled equilibria	Voet and Voet Chpt 3
Jan 9 th	Specificity in binding interactions	Class notes
Jan 14 th	Measuring binding interactions	Class notes
Jan 16 th	Non-covalent interactions in water	Class Notes
Jan 21 nd	Multivalency	Class Notes
Jan 23 th	Chemical kinetics to enzyme catalysis	Class Notes
Jan 28 th	Michaelis-Menton and assumptions	Voet and Voet Chpt 14
Jan 30 st	Meaning of MM parameters	
Feb 4 th	Transition state theory applied to enzymes	Voet and Voet Chp14
Feb 6 th	Bisubstrate kinetics	
Feb 11 th	Midterm 1	Voet and Voet Chpt 14
Feb 13 th	Entropic effects in enzyme catalysis	
Feb 18 th Reading week Feb 21 th	No classes	
Feb 25 st	Transition state stabilization	Voet and Voet Chpt 15
Feb 27 th	Binding energy in catalysis	
March 3 rd	Covalent catalysis	Voet and Voet Chpt 15
March 5 th	Covalent catalysis with co-factors	
March 10 th	Midterm 2	Class Notes
March 12 ^h	Types of inhibitors and telling the difference	Class Notes
March 17 th	Transition state analogues (proteases)	Class Notes
Nov 19 th	Covalent inhibition $K_i/k_{(inact)}$	
March 24 th	Deciphering enzyme catalysis (Lysozyme)	Class Notes
March 26 nd	Designing a mechanism-based inhibitor (Flu)	
March 31 st	Grad Student Presentation(s)	Class notes

April 2nd	Designing enzymes and selection	
-----------	---------------------------------	--

Grading Scheme CHM 447

Mid-term exam 1	:	25%
Mid-term exam 2	:	25%
Final Exam:	:	45%
Participation:	:	5%

CHM 1006

Mid-term Exam 1	20%
Mid-term Exam 2	20%
Presentation	20%
Final Exam	40%

Absence

If you miss a test or a significant period of class work through illness or a related reason, you should request consideration by submitting a completed University of Toronto Student Medical Certificate which is available at the Faculty of Arts and Science web site.

<http://www.artsandscience.utoronto.ca/current/forms.shtml>

The document must be presented within one week of the date of the absence. Only serious illness (or equivalent reason) will be accepted as justification for absence (note: the UofT Medical Certificate, filled out by your doctor, stating that you saw him/her on a given day is not adequate. Your doctor must certify that you were too sick to attend the test, etc.) The form of consideration extended for a particular item of missed term work will be explained to you when you submit the certificate.

Email Policy

For a response...

- All emails must contain a full student name and student number.
- Short questions only. Detailed questions especially those referring to chemical structures should be saved for office hours or face to face. These are very difficult to answer over email.

All efforts will be made to return emails within 24 hrs.

Accessibility Needs:

The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom or course materials, please contact Accessibility Services as soon as possible: disability.services@utoronto.ca or <http://studentlife.utoronto.ca/accessibility>