

# BIOC 750 - Advanced Proteins and Enzymology

## Spring 2018 Schedule

Instructors: Gunther (coordinator), Shiemke, Ma, Smith, Schaller, Tseytlin, Robart, Fagone

Course format and credit hours: lecture, 4 credit hours

Prerequisites: organic chemistry, biochemistry

Schedule: Tues-Thurs, 2-4 PM or as otherwise arranged

Location: 3122A HSN (Wirtz library)

Date	Topic(s)	Chapter	Instructor
<b>January 2018</b>			
Block 1: What are the structures of proteins?			
1/9	Basic protein structure concepts and common motifs	1-2	Schaller
1/11	Common protein domain structures	3-5	Schaller/Robart
1/16	Protein structures that interact with DNA	8-10	Ma
1/18	Intrinsically disordered proteins	literature	Smith
1/23	Energy landscapes and protein folding (or not?)	6	Schaller
1/25	How to learn and predict protein structures	17-18, H2	Robart
1/30	Poster session for structural portion of projects	-	Gunther
Block 2: How do we study proteins			
<b>February 2018</b>			
2/1	Exciting and measuring electronic transitions	H1, 3	Gunther
2/6	First examination covering Block 1	-	faculty
2/8	What happens to an excited electronic state?	H3	Gunther
2/13	Microscopic protein dynamics (single molecule)	-	Smith
2/15	Magnetic resonance approaches to dynamics	H3, 7	Tseytlin
2/20	Mass spectrometry of proteins	H8, lit	Gunther
2/22	How do we characterize protein binding interactions?	literature	Smith
2/27	How do we identify protein binding partners?	literature	Ma
<b>March 2018</b>			
3/1	Fluorescent techniques to characterize binding interactions	H3	Smith/Schaller
3/6	Förster resonance energy transfer	H3	Schaller
3/8	Practical protein information (purification, assay, etc.)	handout	Fagone
3/13-3/15 SPRING BREAK			
3/20	Practical protein information, continued	handouts	Fagone
3/22	Van Liere Research Day, no class	-	-
Block 3: How do proteins work?			
3/27	Project part II: term paper about techniques to study chosen protein due	-	-
3/27	Basic kinetic principles	handouts	Gunther
3/29	EXAM 2, covering block 2	-	Faculty
<b>April 2018</b>			
4/3	Kinetic principles continued and kinetic isotope effects	handouts	Gunther
4/5	Mechanisms: nucleophiles, acids, bases, electrons, etc.	handouts	Gunther
4/10	How do proteins really use energy?	Lit	Smith

4/12	Life in a membrane	Lit	Shiemke
4/17	Example: Protease mechanisms	11	Smith
4/19	Student mechanism presentations	-	Gunther
4/24	Example: Nitric Oxide Synthases	Lit	Shiemke
4/26	Student Mechanism presentations	-	Gunther
<b>May 2018</b>			
5/1	Exam 3 covering the material in block 3	-	Faculty and students

Labeled chapters are in the textbook, Branden and Tooze (2nd edition). Reading referenced as "H#" is the relevant chapter in the supplemental text, "Spectroscopy for the Biological Sciences" by Hammes.