



**MARTHA BRADLEY EVANS**  
**Center for Teaching Excellence**  

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**THE UNIVERSITY OF UTAH**

**BIO C 6420 – Biophysical Methods**

2<sup>nd</sup>-half Fall Semester 2024

Tu/Th, 2:30-3:50; HSEB 2958

**Instructors:** Michael S. Kay (course director), Wesley Sundquist, and Owen Pornillos

**Email:** kay@biochem.utah.edu

**Phone Number:** 801-585-5021

**Office Hours:** TBA

**Office Location:** BPRB 108F

**Course Description**

This course will focus on biochemical and biophysical approaches to studying proteins and their functional interactions. Topics covered will include: protein-ligand interactions, cooperativity and allostery, protein folding and design, spectroscopic techniques, analytical ultracentrifugation, calorimetry, biosensors, proteomics approaches, and protein structure prediction.

Prerequisite: MBIOL 6410 or BLCHM 6410 or equivalent.

**Course Outcomes and Objectives**

By the end of this course, you will be able to:

- Explain the physical principles behind common protein biophysical techniques
- Perform and interpret quantitative data analysis using nonlinear regression
- Design and interpret experiments using common protein biophysical techniques
- Use current AI-informed to predict and design protein structures

**Course Requirements**

- Homework assignments (3 problem sets, 20% each) – 60%
- Two take-home exams (20% each) – 40%

**Grading Scale**

This course will be graded on an A to F scale.

**University Policies**

Updated mandatory syllabus policies regarding the ADA Act, Safety at the U, Addressing Sexual Misconduct, and Academic Misconduct can be viewed at: <https://cte.utah.edu/instructor-education/syllabus/institutional-policies.php>

**Preliminary Course Schedule**

<u>Date</u>	<u>Topic/Discussion</u>	<b>Due Dates:</b>
<b>Week 1:</b>	Review of thermodynamics and kinetics Introduction to curve fitting	

<b>Week 2:</b>	Advanced curve fitting Spectroscopic techniques 1	
<b>Week 3:</b>	Spectroscopic techniques 2 Protein folding	
<b>Week 4:</b>	Catch up and review Protein mass spectrometry	Homework #1 due 11/7
<b>Week 5:</b>	Proteomics No class 11/14	
<b>Week 6:</b>	Analytical ultracentrifugation Biosensors	Homework #2 due 11/26
<b>Week 7:</b>	Mass photometry (& other modern binding assays) AI protein structure prediction & design 1	
<b>Week 8:</b>	AI protein structure prediction & design 2	Homework #3 due 12/9
<b>Finals Week:</b>	Combined take-home final exam handed out 12/6, due 10 am 12/13	