Course Outline

Chemistry 4494A / 9494A

BIOPHYSICAL CHEMISTRY – 2022

Instructor: Lars Konermann; B&G 2016

Lectures: Monday, Wednesday & Friday 10:30-11:20, CHB-9

Outline: An overview of the physical principles underlying the structure, function, and dynamics of biological systems, with focus on proteins and biomembranes. Topics to be covered include: Selected applications of thermodynamics and statistical mechanics; inter- and intramolecular (noncovalent) interactions; protein folding; spectroscopic properties of biopolymers.

Prerequisite: Chemistry 2374A (Thermodynamics)

Evaluation:

Problem assignments:	12% (there will be ~7 assignments)
In-class test 1:	24% (Friday, October 7, 10:30 – 11:20 AM)
In-class test 2:	24% (Friday, October 28 , 10:30 – 11:20 AM)
Final exam:	40% (date & time TBA)

There will be no "make-up" tests or "make-up" assignments. If you miss a test or assignment with a valid excuse, your overall mark will be based on the other course components with appropriate re-weighting.

If you miss a test or assignment: Contact one of the counsellors in the Dean's office and provide your documentation to *them*. The Dean's office will then contact the course instructor.

Exception: You are allowed to miss one assignment without an excuse. For students that complete all assignments, the assignment with the lowest mark will be dropped.

Literature: *Detailed lecture notes will be provided*.

There is no text for this course. The lecture notes will contain all the information required for assignments and exams. Nonetheless, the following books may be helpful:

- van Holde, Johnson & Ho "Principles of Physical Biochemistry" 2nd edition, 2006.
- Dill & Bromberg "Molecular Driving Forces", 2nd Edition Garland Science, New York, 2010.
- Tinoco et al. "Physical Chemistry: Principles and Applications in Biological Sciences", 4th edition Prentice Hall, Upper Saddle River, 2002.
- Creighton "Proteins", 2nd edition, Freeman, New York, 1993.
- Fersht "Structure and Mechanism in Protein Science", Freeman, New York, 1999.
- ... as well as standard physical chemistry texts such as Atkins, Noggle, etc.

Learning Outcomes
Upon completion of this course, students will be able to:

- Understand the properties of various amino acids;
- Apply concepts of statistical mechanics to simple biological systems;
- Understand how different types of molecular interactions govern native protein structures, and how environmental changes can trigger folding or unfolding;
- Apply physicochemical concepts that govern the formation of protein-ligand interactions.
- Interpret data obtained by various spectroscopic and calorimetric techniques.

Use of Electronic Devices
On tests and exams, only basic scientific calculators are allowed; all other devices (cell phones, laptops, tablets, cameras, etc.) are prohibited.

Accommodation and Accessibility

Religious Accommodation
When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at https://multiculturalcalendar.com/ecal/index.php?s=c-univwo.

Accommodation Policies

Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic Accommodation_disabilities.pdf.

Academic Policies

The website for Registrarial Services is http://www.registrar.uwo.ca.

In accordance with policy,

https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf,

the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at their official university address is attended to in a timely manner.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: https://www.uwo.ca/sci/counselling/.

Students who are in emotional/mental distress should refer to Mental Health@Western (https://uwo.ca/health/) for a complete list of options about how to obtain help.

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at

https://www.uwo.ca/health/student_support/survivor_support/get-help.html.

To connect with a case manager or set up an appointment, please contact support@uwo.ca.

Learning-skills counsellors at the Student Development Centre (https://learning.uwo.ca) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Additional student-run support services are offered by the USC, https://westernusc.ca/services/.