

BB482 / 582 Molecular Biophysics II: Macromolecular Structure

Winter 2016

Instructor	Dr. Colin Johnson 2041 Ag. Life Sci. Bldg. (ALS) (541) 737-4517 ; johncoli@oregonstate.edu
Day, Time and Location	Mondays, Wednesdays & Fridays 1:00 – 1:50 pm, LInC Office Hours: By appointment, ALS 2143 (office)
Course Objectives	This course provides an introduction to structural biology, the discipline focused on understanding the structural properties of biological macromolecules – especially proteins – and relating them to their function. The course introduces students to the vocabulary and tools of this discipline, covering both the fundamental physicochemical principles governing the structure and function of biological macromolecules and a selected set of widely used experimental approaches to their characterization. This is done through lectures, and textbook and literature readings. Graduate students and undergraduate students will take different exams, and students will also present a literature-based term project.
Learning Resources	Assigned readings and articles from the literature. Recommended Text and Readings: <i>“Principles of Physical Biochemistry, 2nd Ed.”</i> by van Holde, Johnson, and Ho <i>“The Molecules of Life”</i> by Kuriyan, Konforti, and Wemmer <i>“Physical Biology of the Cell”</i> by Phillipis, Kondev, and Theriot BB Departmental and CGRB Seminars, alternate Wednesday, 3:30 – 4:30pm, ALS 4001
Course Policies	Prerequisites: BB 450 / 550 or BB 490 / 590 Incompletes: Take this course only if you plan to finish it in a timely manner (during this term). An "Incomplete" will only be given when there is a strong and compelling case for doing so (e.g., health reasons, military commitment).

Learner Outcomes

When confronted with a biochemical phenomenon, students should be able to rationalize how to examine, model, and analyze the system and effectively communicate the results. Through taking this course, successful students will:

- 1) Understand the breadth of the discipline of biophysics and the importance of knowing molecular structure and biophysical forces in biology. (BB 482/582)
- 2) Acquire the technical language for techniques used in physical biology and be able to recall key elements of these techniques, including the concepts behind the experiments and the types of results obtained. (BB 482/582)
- 3) Understand the fundamental thermodynamic principles governing protein-protein interactions as well as molecular recognition. (BB 482/582)
- 4) Be able to apply the above concepts with the principles of logic to solve realistic, specific problems in biophysical chemistry and to understand and critically evaluate research papers in this field. (BB 482/582)
- 5) Intelligently analyze, interpret and appraise the soundness of the findings obtained (which involves being able to make basic order-of-magnitude estimates). (BB 582)
- 6) Demonstrate the ability to produce quality critical analysis. (BB 582)

Learner Expectations

First and foremost, I expect everyone to respect one another. Among other things, this means that only one person speaks at a time, no cell phone usage in class, and that each of you put forth an honest effort in class. Arrive to class on time every day, prepared and with all necessary materials, ready to discuss the topic for the day.

I hope that this class will be very active and expect each of you to participate as much as possible. Don't be afraid to ask questions or make mistakes – both are key in helping you understand the subject material. This course will require you to spend time each week reading the assigned material and participating in classroom discussions.

Course Evaluation	<p>Fulfillment of the student learning outcomes will be assessed through three exams, and in the case of BB 581 an additional written assignment, as follows:</p> <table border="1" data-bbox="632 245 1703 423"> <thead> <tr> <th></th> <th style="text-align: right;">BB 482/582</th> </tr> </thead> <tbody> <tr> <td>Exam #1</td> <td style="text-align: right;">25 %</td> </tr> <tr> <td>Exam #2</td> <td style="text-align: right;">25 %</td> </tr> <tr> <td>Weekly quizzes</td> <td style="text-align: right;">25 %</td> </tr> <tr> <td>Presentation Project</td> <td style="text-align: right;">25 %</td> </tr> </tbody> </table>		BB 482/582	Exam #1	25 %	Exam #2	25 %	Weekly quizzes	25 %	Presentation Project	25 %
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Concepts to be covered	<ul style="list-style-type: none"> - diffusion, transport, electrophoresis, ultracentrifugation - crowding - binding kinetics, fluorescence methods to monitor dynamics - binding specificity - membrane chemistry, lipid rafts, lipid phases - membrane proteins - ion channels, action potentials, membrane fusion - 										
Statement Regarding Students with Disabilities	<p>Please note: “Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 541-737-4098.” (From: http://ds.oregonstate.edu/faculty-and-staff-guidelines)</p>										

University Rules on Civility and
Honesty

The University's code on responsible behavior is outlined in the Student Conduct Code:

http://studentlife.oregonstate.edu/sites/studentlife.oregonstate.edu/files/student_conduct_code_1.pdf

Cheating or plagiarism by students is subject to the disciplinary process outlined in the Student Conduct Regulations.

This course follows the university rules on civility and honesty. These can be found at:

<http://oregonstate.edu/instruct/cssa556/CIVHON556.htm>

To paraphrase: "Students are expected to be honest and ethical in their academic work. Academic dishonesty is defined as an intentional act of deception in one of the following areas:

Cheating-use or attempted use of unauthorized materials, information or study aids

Fabrication-falsification or invention of any information

Assisting-helping another commit an act of academic dishonesty

Tampering-altering or interfering with evaluation instruments and documents

Plagiarism-representing the words or ideas of another person as one's own"

Behaviors disruptive to the learning environment will not be tolerated and will be referred to the Office of Student Conduct for disciplinary action.

"The goal of Oregon State University is to provide students with the knowledge, skill and wisdom they need to contribute to society. Our rules are formulated to guarantee each student's freedom to learn and to protect the fundamental rights of others. People must treat each other with dignity and respect in order for scholarship to thrive. Behaviors that are disruptive to teaching and learning will not be tolerated, and will be referred to the Student Conduct Program for disciplinary action. Behaviors that create a hostile, offensive or intimidating environment based on gender, race, ethnicity, color, religion, age, disability, marital status or sexual orientation will be referred to the Affirmative Action Office."
