BB496/596 Biochemistry Laboratory: Molecular Modeling Winter 2019

Instructor	Dr. Victor Hsu 2143 Ag. Life Sci. Bldg. (ALS) (541) 737–4398 ; hsuv@onid.orst.edu
Credits, Day, Time and Location	Course Credits: 1 Date & Time: Thursdays, 4:00 – 4:50 pm Location: Weniger Hall 149 Office Hours: Thursdays, 1:00 – 2:00 pm or by appointment
Course Objectives	This course is a hand-on, computer-based laboratory course designed to introduce students from biochemistry and related fields to the fundamentals of protein structure and protein sequence analysis. Aspects of visualizing biomolecular structures will also be introduced. Will include programming and practical experience with command-line tools and pre-compiled software packages.
Learning Resources	Assigned readings and articles from the literature and from online resources.
Course Policies	Prerequisites: BB 494 (may be taken concurrently) 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 protein sequence of interest, students should be able to examine, analyze and model the protein and effectively communicate the results. As a result of taking this course, students will be able to: Develop conceptual frameworks to analyze protein sequences by identifying the key principles and constraints underlying a multi-sequence alignment. Demonstrate an appropriate level of competence in the ability to apply, modify and/or create and contrast computational algorithms designed to qualitatively and/or quantitatively analyze protein sequences, and to evaluate the relative advantages and disadvantages of the different computational algorithms.

	Understand the underlying concepts of homology modeling and analyze a model of the protein sequence of interest, and appraise the soundness of the findings obtained. Use basic python programming, command-line software, pre-compiled software packages, and online software to answer specific biochemical questions about proteins, protein sequences and protein structures. Write basic python code to read and write protein structure files, utilize functions as a programming framework, and extend the functionality of an existing program, PyMol, by writing a python program. Demonstrate the ability to produce quality critical analysis. Critically evaluate protein molecular modeling results and analyses that are reported in a research paper from the current literature.
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. I expect that students to attend lectures and to make use of office hours to assist in the understanding of the topics and concepts covered in this course.
Course Evaluation	Fulfillment of the student learning outcomes will be assessed through weekly homework, a homology modeling project, and a python-based PyMol project as follows: BB 496 Seven homework problem sets, 20 points each 58.3 % Final project (due Thursday, March 14th), 100 points 41.7 % Details, requirements, and grading scheme for the Final project will be provided during lectures.

Statement Regarding Students with Disabilities	Please note: "Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at http://ds.oregonstate.edu. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations."
University Rules on Civility and Honesty	The University statement on student conduct and community standards can be found at: http://studentlife.oregonstate.edu/code. *Cheating or plagiarism by students is subject to the disciplinary process outlined in the Statement of Expectations for Student Conduct (*http://studentlife.oregonstate.edu/studentconduct/offenses-0) 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."*