University of Oklahoma  
College of Arts and Sciences  
Chemistry and Biochemistry  
CHEM 5760: the Structural Basis of Biomacromolecular Interactions  
Spring 2016 (module 2)  

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Office Hours: by appointment  
Learning Management System: https://learn.ou.edu

Course Meeting Time, Location: Feb. 29 – April 6, Mon / Wed 8:30-9:50am, SLSRC 2410

Course Prerequisite: Graduate standing or permission of the instructor. Incoming students should have firm command of protein composition and structure; additional understanding of nucleic acid structure is beneficial.

Course Description: Biomolecular interactions are the fundamental components of all of biochemistry. This course will provide an overview with specific examples of interactions, and will integrate measurement of atomic contacts with thermodynamics and energetics, and briefly explain techniques to measure these. While this course will be of interest to students interested in biochemistry, it is designed as a component of a curriculum in structural biology.

Course Goals: Students will be able to recognize interacting motifs, distinguish favorable interactions from less favored, and suggest improvements to strengthen interactions. Students will also be able to objectively evaluate evidence of interactions and understand inherent assumptions or weaknesses in methods. These skills will be useful to any studies of macromolecules, and especially to predict interactions and relative strengths as well as interpret interactions from a variety of data formats.

Texts and Materials:
- There is no assigned textbook; reading material will be provided from a variety of sources. Please come to class prepared to discuss that day’s reading material!
- You should bring a computer to class each day. During the first class meeting we will discuss different computer programs, and you will be expected to install some or all of these onto your computer for use throughout the class.
- You should also have a particular biochemical system of interest to you for projects throughout the class. It is expected that this will be relevant to your dissertation research. During the first class meeting we will review how to find structural information for particular topics.
Teaching Philosophy: At the level of graduate instruction, my role as instructor is to provide you with information that will facilitate discussion and ultimately your learning about the topic.

Expectations: You are expected to show up, on time, for every scheduled class. You are expected to have completed the assigned readings before class, and come prepared to discuss the content.

Absences: Given that there are only 10 scheduled meetings, every meeting will be important and absences should be avoided.

Assignments: Given that there are only 10 scheduled meetings, it is expected that students will complete assignments on time. No make-up work or late assignments will be accepted.

Because this is an advanced graduate class, there will be no exams. There is no textbook. There is only participation, and assignments to make sure you get around to reviewing what we discuss.

Many assignments will rely on using computational tools, and in the beginning these may be unfamiliar to the student. It will be easy to become frustrated, but you should resist this reaction. You are encouraged to seek help from a multitude of on-line resources, other students, and the instructor. I typically respond to emails from students immediately, but can guarantee a response within 24 hours.

Tentative Schedule

<table>
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<tr>
<th>Date(s)</th>
<th>Topics /Activities</th>
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| Feb. 29th | Basics of protein structure  
Protein Databank  
Software tools |
| March 1st | Specific atomic interactions and energetics/ thermodynamics |
| March 7th | Protein:protein interactions, self-assembly |
| March 9th | Protein:small(er) molecule interactions: "Drugs", Catalysis |
| March 21th | Protein:small(er) molecule interactions: Co-factors, Prosthetic groups, Fragments |
| March 23rd | Protein:other interactions: Nucleic acid (DNA, RNA) |
| March 28th | Protein:other interactions: Lipids, Carbohydrates |
| March 30th | Role of post-translational modifications, allostery vs. lock and key, water, IDP’s |
| April 4th | Movies and Figures |
| April 6th | Designing proteins for function |

This syllabus and schedule is a guide. The instructor reserves the right to change any times contained in this syllabus. This includes, but is not limited to: course content, scheduled dates, and calculation of the final grade.
University Policies

Codes of Behavior
Each student should acquaint themselves with the University's codes, policies and procedures involving academic misconduct, grievances, sexual and ethnic harassment, and discrimination based on physical handicap. Students engaging in academic misconduct (including cheating, plagiarism, and any other action that may improperly affect evaluation) will be subject to sanctions in accordance with the Norman Campus Academic Misconduct Code. Grade sanctions could range from a zero for the specific assignment to an "F" for the course. University sanctions can be severe, i.e., expulsion from the University.

Academic Integrity
Cheating is strictly prohibited at the University of Oklahoma, because it devalues the degree you are working hard to get. As a member of the OU community it is your responsibility to protect your educational investment by knowing and following the rules. For specific definitions on what constitutes cheating, review the Student's Guide to Academic Integrity at http://integrity.ou.edu/students_guide.html.

To be successful in this class, all work on exams and quizzes must be yours and yours alone. You may not receive outside help. On examinations and quizzes you will never be permitted to use your notes, textbooks, calculators, or any other study aids unless I give permission. Should you see someone else engaging in this behavior, I encourage you to report it to myself or directly to the Office of Academic Integrity Programs. That student is devaluing not only their degree, but yours, too. Be aware that it is my professional obligation to report academic misconduct, which I will not hesitate to do. Sanctions for academic misconduct can include expulsion from the University and an F in this course, so don't cheat. It's simply not worth it.

Religious Observance
It is the policy of the University to excuse the absences of students that result from religious observances and to reschedule examinations and additional required classwork that may fall on religious holidays, without penalty.

Reasonable Accommodation Policy
Students requiring academic accommodation should contact the Disability Resource Center for assistance at (405) 325-3852 or TDD: (405) 325-4173. For more information please see the Disability Resource Center website http://www.ou.edu/drc/home.html Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact me personally as soon as possible so we can discuss accommodations necessary to ensure full participation and facilitate your educational opportunities.

Title IX Resources and Reporting Requirement
For any concerns regarding gender-based discrimination, sexual harassment, sexual assault, dating/domestic violence, or stalking, the University offers a variety of resources. To learn more or to report an incident, please contact the Sexual Misconduct Office at 405/325-2215 (8 to 5, M-F) or smo@ou.edu. Incidents can also be reported confidentially to OU Advocates at 405/615-0013 (phones are answered 24 hours a day,
7 days a week). Also, please be advised that a professor/GA/TA is required to report instances of sexual harassment, sexual assault, or discrimination to the Sexual Misconduct Office. Inquiries regarding non-discrimination policies may be directed to: Bobby J. Mason, University Equal Opportunity Officer and Title IX Coordinator at 405/325-3546 or bjm@ou.edu. For more information, visit http://www.ou.edu/eoo.html.

Adjustments for Pregnancy/Childbirth Related Issues
Should you need modifications or adjustments to your course requirements because of documented pregnancy-related or childbirth-related issues, please contact your professor or the Disability Resource Center at 405/325-3852 as soon as possible. Also, see http://www.ou.edu/eoo/faqs/pregnancy-faqs.html for answers to commonly asked questions.