

Instructor:	Chuan (River) Xiao	Phone:	747-8657
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Class Meet:	TR 3:00-5:50am @ BE 300/302	Office Hrs:	After class TR 1:30-2:30pm <u>or by appointment</u>
Scope:	The course will be an introduction to the fundamental knowledge of structures of biological molecules as well as to the principles of modern methods, such as X-ray crystallography and cryo-electron microscopy, used for the three-dimensional structural determination and simulation of macromolecules of biological interest. The course will have practical exercises (lab) that will enhance student's learning of the concepts and prepare student with skills in analyze and model biological molecules.		
Objective:	Students who complete this course will be able to understand structural biological literature and use the principles and concepts of learned in the class to analyze and model biological structures.		
Prerequisites:	It is recommended that students take CHEM 3330 and obtain B above grade prior taking this course. It is also recommended that students take BINF 5111 together with the course.		
Class Meetings:	Tuesday & Thursday 3:00-5:50am at BE 300/302 (combined with BINF 5111) (All cell phones and pagers should be turned <u>OFF</u> during class!!!)		
Required Materials:	No textbooks will be required. Most information can be obtained from on-line resources (Wikipedia.org) or research papers. However, students can refer to the following books for in-depth studies: <ol style="list-style-type: none"><u>Protein structures</u>: Lehninger <i>Principles of Biochemistry</i>, Nelson and Cox; W. H. Freeman Company, New York, 5th Ed. or 6th Ed.<u>X-ray crystallography</u>: <i>Crystallography Made Crystal Clear: A Guide for Users of Macromolecular Models</i>, Rhodes, G., Elsevier/Academic Press, Amsterdam/Boston, 2nd or 3rd Ed.Cryo-electron microscopy: <i>Three-Dimensional Electron Microscopy of Macromolecular Assemblies</i>, Frank, J., Academic Press/Oxford University Press, San Diego/New York.		
Class Attendance:	<u>CLASS ATTENDANCE IS REQUIRED</u> : Attendance will be routinely taken in the form of quiz and questions during the lecture. Students will also be called by name randomly to answer questions. Students are responsible for attending lecture regularly and knowing what takes place during classes. This includes not only the material covered in the class, but also all announcements, changes in the syllabus, etc. <u>IF</u> you <u>MUST</u> miss a class, <u>YOU</u> need to make a special effort to learn what occurred during your absence. You also need to submit documents to be approved by the instructor for your absence to get documented absences (DA) so that it will not affect your quiz scores. Otherwise, zero score will be included in your quiz average. Absence documents that are submitted two weeks later than the absence date will <u>NOT</u> be accepted.		
Quiz, Exam and Lab Project Policy:	<ol style="list-style-type: none"><i>Quiz Rules</i>: Students should follow examination rules as below except can have their belongings with them.<i>Exam Rules</i>: Students should sit separately. Students are highly suggested to go to the restroom before the exam. During the exam, only one student a time can go to the restroom and might be accompanied by the proctor. Remove baseball caps. Do not look around. No talking, no joking, no sharing of pencils and erasers. Cellular phone and all other electronic devices must be turned off and put away. All belongs must be put on the floor on the side or in front of the classroom and put away out of sight. No calculators or other electronic devices are allowed. Only pencil, eraser and Scantron sheet (if required) are allowed to be used during the exam. Do not disrupt student around you if you finish the exam earlier. Suspicious activity will be dealt with accordingly.<i>Lab Project Rules</i>: Students will have many days to finish the project assignment. <u>NO EXTENSION OF DEADLINE</u> will be given after the due time.Please go over your exam after it is handed back and check for adding/grading errors. Except for clerical errors, re-grade requests will be a reevaluation of the entire exam. Be aware that returned exams will be photocopied prior to handing back!		

Withdrawal Policy:

There is a deadline (Mar. 30th) for you to withdraw from any course with an automatic "W". Please note that it is the student's responsibility to officially withdraw from a course. The College of Science (CoS) will remain aligned with the University and not approve any drop requests after that date. All grades of Incomplete "I" must be accompanied by an Incomplete Contract that has been signed by the instructor, student, departmental chair, and the dean. The CoS requests the contract be limited to one month based upon completion data. A grade of "I" is only used in extraordinary circumstances confined to a limited event such as a missed exam, project, or lab. If the student has missed a significant amount of work (e.g. multiple assignments or tasks), a grade of Incomplete is not appropriate or warranted.

Course Grading:

Final grades in the course will be determined using scores from quizzes, exams and lab projects. Quizzes will be given during the classes and will contribute 10% of the final grade. There will be two exams (one mid-term and one final), each contribute 30% of the final grade. The lab projects will contribute 30% of the final grade.

Academic Integrity Policy:

Suspected cases or acts of alleged scholastic dishonesty (CHEATING) in quizzes, exams or lab projects will be dealt with University regulations. This means automatic referral to any adjudication by the Dean of Students.

Disability:

If you have or suspect a disability and need accommodations, you should contact The Disabled Student Services Office (DSSO) at 747-5148. You can also email the office at dss@utep.edu or go by the Union Building East, Room 106. For additional information, visit the DSSO website at www.utep.edu/dsso/.

Tentative Schedule for material to be covered*

Date	Lecture	Lab
January 17 th	First day of classes, Review syllabus	
19 th	No class due to snow	Set up accounts and Unix login and basic command
24 th	1. Structure of AA, Proteins,	
26 th		(1) AA presentation and Introduction of Linux
31 st	2. Protein structures	
February 2 nd		(2) Unix commands
7 th	3. Protein Modifications and Folding	Project 1 assignments
9 th		(3) Introduction of C Shell script languages Script
14 th	4. Protein Techniques and Modeling	Seminar paper review submission**
16 th		(4) Multiple sequence alignment
21 st	5. Protein Modeling and Fourier Transfer	Project 2 assignments
23 rd		(5) Chimera
28 th	6. Fourier Transfer and Space Group	
March 2 nd		Symposium 1 (BINF 5111)**
7 th	7. X-ray crystallography	
9 th	No class prepare for Mid-term	Deadline for project 1
14 th	Spring Break, no classes	
16 th	Spring Break, no classes	
21 st	Mid-term Exam 3:00pm-5:50pm @ BE 300	
23 rd		(6) CCP4
28 th	8. X-ray crystallography	
30 th		(7) CCP4 and Chimera, model superpose
April 4 th	9. Cryo-EM	Seminar paper review submission**
6 th		(8) HKL, Mosflm and Coot
11 th	10. Cryo-EM	Deadline for project 2
13 th		(9) Cryo-EM reconstruction
18 th	11. Cryo-EM	Project 3 assignment
20 th		(10) Cryo-EM reconstruction
25 th	12. Cryo-EM	
27 th		(11) Cryo-EM reconstruction
May 2 nd	13. Cryo-EM+X-ray crystallography	
4 th	Symposium 2 (BINF 5111)**	
May 5 th	Dead Day	
9 th	Final Exam 3:00pm-5:50pm @ BE 300	
11 th		Deadline for project 3

* We may end up going slower or faster depending on how the class is doing

** See BINF 5111 for details.

*** If we are slower than the schedule, we will use these classes to catch up.