BIOCHEMICAL CALCULATIONS
Biochemistry 404, Section 501
Fall Semester 2017
Room 107 Biochemistry, Mondays and Wednesdays 12:40PM – 1:30PM

Instructor: Gary R. Kunkel, Associate Professor of Biochemistry
e-mail: g-kunkel@tamu.edu
phone: 845-6257

Meeting with me outside of class:
Contact me by email to set up a time for a meeting within, or just outside, the AgCafe in the first floor of the Biochemistry Building. Suggested times are during the following slots, but still requires an appointment time in advance:
- Tuesdays, 1 – 2PM, or Wednesdays, 9 – 10AM.
- Alternatively, if these slots do not fit your schedule, suggest other times, and we will work out something suitable for both of us.

Administrative contact: Ms. Tillie Rausch, 410 Biochem Building, trausch@tamu.edu
All problem sets and the midterm exam can be picked up from Tillie throughout the semester.

Class website: You will be able to access problem set keys, a list of knowledge objectives, and any class handouts on the TAMU eCampus site. Although there is not a required textbook for this course, reading material linked to the eCampus site is considered "essential reading." In addition to the above information, you can use the eCampus site to view your problem set and exam scores as they are posted, and final grades in the course at the end of the semester.

Course coverage: BICH 404 is a relatively new course in our curriculum. It is designed to be taken concurrently with first-semester biochemistry (BICH 440). The course will cover quantitative topics that are important for biochemists, such as acid-base chemistry, buffers, biochemical thermodynamics, concentrations of biochemical macromolecules, simple statistical comparisons, binding equilibria, cooperativity, and kinetics of binding reactions.

Learning outcomes: Upon successful completion of this course, you will understand and be able to solve problems involving the following concepts: acid-base equilibria, biological buffers, biochemical thermodynamics, methods to determine concentrations of proteins and nucleic acids, affinity constants for bimolecular association/dissociation, cooperativity in binding reactions, measurement of rate constants for single-step binding reactions

Prerequisites: BICH 440, or registration therein; junior or senior classification

Attendance: As is true for all of your courses, one key to success is attending class. For this course, I will keep a record of attendance – a modest number of points will be awarded for attendance. Your attendance will be verified by a sign-in sheet during class.

Individual Problem Sets, Group Problem Sets and Exams:
- Four individual problem sets to be turned in at the **beginning** of class:

Prob. Set #1	Monday, Sept. 18
Prob. Set #2	Wednesday, Oct. 4
Prob. Set #3	Monday, Nov. 6
Prob. Set #4	Wednesday, Nov. 29

All work submitted must be your own. Duplicate submissions of any answers by two or more persons will be considered academic dishonesty.

Problem sets submitted past the deadline will be accepted up to 2 days late with the following penalties:

First day (before Thursday/Tuesday, 2PM): subtract 20% of your score
Second day (before Friday/Wednesday, 2PM): subtract 30% of your score
Problem sets will not be accepted after Friday (or Wednesday), 2PM. At that time you will receive a zero.

Four group problem sets to be turned in at the **end** of class:

Group Set #1:	Monday, Sept. 11
Group Set #2:	Monday, Oct. 9
Group Set #3:	Wednesday, Oct. 25
Group Set #4:	Monday, Nov. 20

All group members will receive the same score. You must be present. Make-up only with excused absence.

Midterm Exam: Monday, Oct. 16
(With proper excuse, makeup exam is scheduled for Friday, Oct. 20, 12:40AM)

Final Exam: Monday, Dec. 11, 10:30AM – 12:30PM

You should bring a calculator to the exams. The memory bank on all calculators must be emptied before the exam begins.

Make-up exams will be offered to students only in the cases of officially recognized absences (see University Student Rules, section 7; http://student-rules.tamu.edu/rule07), or by special request in advance of the exam. You must notify me as soon as possible regarding any excused absences. If at all possible, the Midterm make-up exam will be on Oct. 20. For any make-up exam, you must report WITHOUT any bags (just yourself, pen/pencil, calculator). If you miss the make-up exam, you will receive a zero for the exam.

If you want any problem set or midterm exam answers re-graded, requests must be submitted to me **in writing** along with the entire problem set/exam. The deadline for submitting materials for re-grading is one week after the graded problem set/exam is ready to be picked up.

Grading:
The course grade will be determined based only on the total points accumulated from problem sets, the exams, and attendance (total possible points = 300). There will be no opportunity to earn extra credit by doing extra work.

Points will be accumulated as follows:

Individual Problem Sets	94 pts (22-25 pts each time)
Group Problem Sets	40 pts (10 pts each time)
Midterm Exam	60 pts
Final Exam	80 pts
Attendance	26 pts (one point each non-exam day)
Total	300 pts

The final grade in the course will be assigned as follows: 90-100% = A; 80-89% = B; 70-79% = C; 60-69% = D; less than 60% = F.
I may adjust this scale, but never in an upward manner to negatively affect your grade.

Use of Cell Phones during Class:
Do not use your cell phone during class. You may think it is not obvious to me when you are texting – You are wrong about that. It is very rude. Furthermore, you may think you can pay attention in class while using your cell phone – You are wrong about that too.

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information visit http://disability.tamu.edu.

Aggie Honor Code: "An Aggie does not lie, cheat, or steal or tolerate those who do." Academic integrity is paramount in all activities during this course. On each problem set and the exams, you will be required to sign a statement acknowledging that you have observed this honor code. See the Honor Council Rules and Procedures at http://aggiehonor.tamu.edu

Schedule of Lectures / Assignments / Exams:

Date	Topic	Assignment Due
08/28	No classes	
08/30	Introduction / Survey Quiz	
09/04	Basic math skills / Dilutions / Significant figures	
09/06	Acid-base equilibria / Multiprotic acids / Buffers	
09/11	Group problem solving	**Group Set #1**
09/13	Acid-base equilibria / Multiprotic acids / Buffers	
09/18	Buffers / Titrations / Isoelectric points	**Problem Set #1**
09/20	Discuss problem sets	
09/25	Biochemical thermodynamics	
09/27	Constructing and interpreting simple graphs	
10/02	Bar graphs, whisker plots, error bars	
10/04	Descriptive statistics	**Problem Set #2**
10/09	Group problem solving	**Group Set #2**
10/11	Discuss problem sets / Exam preparation	
10/16	Midterm Exam	**Midterm Exam**
10/18	How to express and determine concentration	
10/23	How to determine concentration using labeling	
10/25	Group problem solving	**Group Set #3**
10/30	Bimolecular association & dissociation	
11/01	Measuring affinity constants	
11/06	Measuring affinity constants	**Problem Set #3**
11/08	Discuss problem sets	
11/13	Three component interactions	
11/15	Measuring cooperativity	
11/20	Group problem solving	**Group Set #4**
11/22	No class	
11/27	Chemical kinetics, rate constants	
11/29	Measuring rate constants	**Problem Set #4**
12/06	Rate constants / Getting ready for Final Exam	
12/11	**Final Exam** 10:30AM	**Final Exam**