BioC 4331 Biochemistry I:  
Structure, Catalysis, and Metabolism in Biological Systems  
Fall Semester, 2014, 4 credits  
MW / 10:10-11:00 AM, Moos Tower, 2-620  
T/Th 10:10-11:00 AM, Phillips Wagensteen Building, 2-470*  
(*Thursday, Oct. 16 class meets in Moos 2-620)

Instructors  
Dr. Timothy Griffin  
Biochemistry, Molecular Biology & Biophysics  
7-144 MCB, Minneapolis Campus  
e-mail: tgriffin@umn.edu  
phone: 612-624-5249  
office hours: Monday 2:00 to 4:00 (when lecturing)  
or by appointment.  

Dr. Paul Siliciano  
Biochemistry, Molecular Biology & Biophysics  
6-110 MCB, Minneapolis Campus  
e-mail: pauls@umn.edu  
phone: 612-625-4928  
office hours: By appointment

Dr. Yue Chen  
Biochemistry, Molecular Biology & Biophysics  
7-114 MCB, Minneapolis Campus  
e-mail: yuechen@umn.edu  
phone: 612-626-3340  
office hours: By appointment

Teaching Assistants:  
Graduate: Bryan Jones (jone0803@umn.edu)  
Undergraduate: Tobias Donlon (donlon003@umn.edu)  
Bob Evans (evans858@umn.edu) (Oct. 20-Nov. 16)

Description: BioC4331 covers structure, catalysis, metabolism in biological systems. Dr. Griffin presents the first half of the course; Drs. Siliciano and Chen present the second. The first 12 lectures review basic chemical concepts and then discuss primary structure (amino acids and sequence), secondary structure (helices, sheet turns), tertiary structure (folding, three dimensional structure) and quaternary structure (subunits and their interactions) of proteins. The next 14 lectures deal with enzyme kinetics and mechanisms and binding interactions. Protein purification and analysis are also discussed. The next 8 lectures discuss carbohydrates, lipid and membrane structures, transport processes. The final 18 lectures discuss metabolic pathways including, glycolysis, glycogen synthesis, the citric acid cycle, oxidative phosphorylation, amino acid and nitrogen metabolism, and lipid synthesis and metabolism. Thermodynamic considerations are emphasized for all pathways.

Prerequisites: Chem 2302 Organic Chemistry II, and Biol 1002 Introductory Biology II: Molecular, Cellular, and Developmental Perspectives or Biol 1009 General Biology. Exceptions only by consent of the instructor(s).

available for purchase through the University Bookstore.

**Appropriate Student Use of Class Notes and Course Materials:** Taking notes is a means of recording information but more importantly of personally absorbing and integrating the educational experience. However, broadly disseminating class notes beyond the classroom community or accepting compensation for taking and distributing classroom notes undermines instructor interests in their intellectual work product while not substantially furthering instructor and student interests in effective learning. It is forbidden to disseminate class materials or to accept compensation for taking and distributing class materials. This means you may not post class materials on any web site. For additional information, please see: [http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html](http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html).


e-mail Course Notices: Course information may occasionally be sent out by email. University of Minnesota regulations require that this correspondence go to your assigned “___@umn.edu” address. Please be sure to check your umn.edu mailbox frequently. Don't forward your umn.edu mail to another account (e.g. hotmail or yahoo), as these accounts can fill up and reject messages.

**Discussion sessions**
Discussion sessions led by the Teaching Assistant will be held once a week (time and place to be announced). They are not meant to discourage asking questions during class. Rather they are designed to clarify points raised in class, to answer questions, and to encourage discussion of study questions. Attendance is recommended but not required.

**Grading and Student Conduct**
The course grade will be relative to the cumulative score for all exams (350 pts); quizzes (100 pts) and problem sets (50 pts). The maximum total points is 500. Graduate students and undergraduates will be evaluated separately. Students are responsible for all information disseminated in class and all course requirements, including deadlines and examinations. Class attendance is not counted in the course grade, but is strongly recommended.

The two major grading systems used are the A-F and S-N. Departmental majors must take major courses on the A-F system; non-majors may use either system. All students, regardless of the system used, will be expected to do all work assigned in the course. Any changes you wish to make in the grading base must be done in the first two weeks of the semester.

**Examinations and Quizzes,** There will be 12 quizzes (10 pts each, the 10 best scores will count towards you grade), 3 in-class exams (75 pts each) and a final exam (125 pts). Lecture material to be covered by each in class exam and quizzes is described in the course lecture schedule. The final exam will consist of 75 pts of new material and 50 pts cumulative material, 25 pts of which will be devoted to material presented by Dr. Griffin. Exams and quizzes will be closed book. Quizzes will consist of ~80-90% multiple choice questions and 10-20% problem and/or structure questions. Quizzes will last only 15 min and a lecture will be given for the remainder of that class period. **Please do not leave at the end of the quiz.** Exams will consist of questions in formats requiring you to explain and diagram concepts, provide short answers or work problems. Any questions about the exam scores or requests for regrades must be submitted within one week after the exams are returned.
**Problem sets**

Problem sets will be posted online several days prior to their due data, which is listed in the course outline. The questions are designed to illustrate or reinforce important concepts or experiment strategies. You must turn in your answers **before the start** of class; no credit will be given for answers turned in after the start of lecture. You can earn a maximum of 50 points for the semester (25 from each instructor).

**Makeup exams.** You must contact the instructor either before the exam or in a timeframe after the exam that is consistent with the reason for missing the exam. The format of the makeup exam is at the discretion of the instructor. You can miss up to 2 quizzes, and you will receive the total points for 10 quizzes taken. If you take all the quizzes, the lowest two scores will be dropped and the ten best scores used towards your final grade. No make up quizzes will be given.

**Electronic Devices:** Only approved calculators may be used during exams. No other electronic devices of any kind, including iPods and cell phones may be used during any examinations. Use of a prohibited device during an examination is considered Scholastic Dishonesty and falls under the University Student Conduct Code.

**Incompletes:** Grades of incomplete will be granted to students who experience illness or other calamities that prevent them from finishing the course. According to University policy, the "I" grade indicates that the instructor:

1) Believes that legitimate reasons due to **extraordinary circumstances** exist to justify extending the deadline for course completion. Examples of extraordinary circumstances include extended illnesses, serious accidents or other emergencies. The student must provide documentation such as a letter from his/her physician to support the claim of **extraordinary circumstances**.

2) Has a reasonable expectation that the student can successfully complete unfinished course work within a specified time frame.

Furthermore, the instructor and student acknowledge that the "I" is not given to help a student improve their grade in the course. The instructor and student must complete and submit the CBS Incomplete Form found at: [http://www.cbs.umn.edu/studentservices/policies.html](http://www.cbs.umn.edu/studentservices/policies.html)

**Academic Misconduct:** Cheating during an exam and altering an exam prior to submission are examples of academic misconduct. Violations of acceptable academic conduct will elicit penalties commensurate with the offense. Penalties can include assignment of a failing grade for an examination or a failing grade for the entire course, depending on the nature and severity of the infraction. Although collaboration during exams is strictly forbidden, students may work together on problem sets. See the "scholastic dishonesty" section of the Student Conduct Code at [http://regents.umn.edu/sites/regents.umn.edu/files/policies/Student_Conduct_Code.pdf](http://regents.umn.edu/sites/regents.umn.edu/files/policies/Student_Conduct_Code.pdf)

Any instances of plagiarism (presenting someone else's work as your own) or cheating will be dealt with through University procedures for academic dishonesty (see Office for Student Conduct and Academic Integrity at [http://www1.umn.edu/oscai/](http://www1.umn.edu/oscai/) for more information).

**Dispute Resolution** In case disputes regarding grades or conduct, student may wish to contact the Student Dispute Resolution Center (SDRC) in 107 Eddy Hall (625-5900) for assistance.

**Disability Accommodations:** The University is committed to providing quality education to all students regardless of ability. Determining appropriate disability accommodations is a collaborative process. You as a student must register with Disability Services and provide
documentation of your disability. The course instructor must provide information regarding a course’s content, methods, and essential components. The combination of this information will be used by Disability Services to determine appropriate accommodations for a particular student in a particular course. For more information, please reference Disability Services: http://ds.umn.edu/.

Sexual Harassment University policy prohibits sexual harassment as defined in the December 1998 policy statement, available at the Office of Equal Opportunity and Affirmative Action. Questions or concerns about sexual harassment should be directed to this office: http://www.policy.umn.edu/Policies/hr/HRMisc/SEXUALHARASSMENT.html

Withdrawals and Deadlines
100% tuition refund, no mark on transcript ..........Tuesday, September 9
75% tuition refund, no mark on transcript .............Monday, September 15
50% tuition refund, W on transcript ..................Monday, September 22
25% tuition refund, W on transcript ..................Monday, September 29

Last day to change status between A-F and S-N .....Monday, September 15th

Consolidated course policies are found at http://www.policy.umn.edu/Policies/Education/Education/SYLLABUSREQUIREMENTS_APPA.html

What does it take to do well in this course?
To receive an A in this course you should expect to study between 8 and 12h per week (2-3h per course credit).
This time should be used to:

• Read suggested chapters and to review class notes (before and after class) and your own notes (after class).
• Work assigned problems sets as well as recommended problems
• Review and integrate the information you have learned from multiple lectures

It is important not to fall behind since new topics in the course will build on previous topics.

If you receive 450 of the 500 points available you will receive an A or an A-. The total points required for an A may decrease depending on class performance this will be discussed the first day of class.

Exams will be given in class on Sept 25th, Oct 21st and Nov 20th.
The final Exam is on Thursday, Dec 17th at 8:00-10:00 AM in 2-620 Moos Tower