

Loyola University Chicago

January 18, 2016 – April 30, 2016 Lectures / Discussions / Exams

Spring 2016

Syllabus: Principles of Biochemistry: CHEM 361/461; BIOL 366 Sec. 004

Lecture: T, R: 02:30 PM – 03:45 PM Flanner Hall 133

Discussion: 005 W 09:20 AM – 10:10 AM Flanner 007; 006 W 12:35 PM – 01:25 PM Flanner 007;
007 W 01:40 PM – 02:30 PM Flanner 007

Instructor: Donald May: Contact: dmay4@luc.edu

Office: Flanner Hall 403; Hours: M, F: 01:00 PM – 02:00 PM; other times by appointment.

Textbook: Biochemistry Concepts and Connections, Appling, Anthony-Cahill, Mathews Pearson, 2016 ISBN-10:0321839765

Method of instruction: Lecture and discussion. Lectures may be supplemented with classroom discussion, use of molecular models, use of multimedia, and/or use of computer based material (Power-point) as well as individual and/or group problem solving. Submitted materials for grading must represent the student's individual work. Supplemental suggested textbook homework problems, for each chapter will be given but are not to be turned in for grading. Discussions may incorporate explanation of theory, review of homework questions or completion of lecture material. Graded exams/discussions will be returned as soon as possible, usually in the next discussion. Issues with graded materials must be submitted within 5 days of being returned, otherwise scores will be considered final. Students must submit a signed statement requesting a review of the question(s), although the entire assignment is now subject to being re-graded.

Grading: Semester grades will be determined by the following criteria:

Exams will incorporate theory up to and including all lectures/discussions/homework, prior to the exam.

Discussion handouts contributing 10% toward the final grade (about 8 total with individual due dates);

Three (3) in-class unit exams; Each unit exam will be 60 minutes in duration and will have about 150 points possible; There will be 25-35 multiple-choice questions and 3-6 long-answer questions of varying point value.

The comprehensive final exam will be about 250 points and have a similar format to the unit exams.

Final grades will be determined from one of the following exam contribution option, whichever is higher:

EXAM CONTRIBUTION OPTION 1: All three (3) unit exams at 20% each = 60% + final exam 30% = 90%

EXAM CONTRIBUTION OPTION 2: Best two (2) unit exams at 20% each = 40% + final exam 50% = 90%

OPTION 1: Discussion Homework: 10%

3 Unit Exams@60% + Final Exam@30%

Total: 100%

OPTION 2: Discussion Homework: 10%

2 Unit Exams@40% + Final Exam @50%

Total: 100%

No early and no make-up in-class exams; No late discussion handouts. For a single, missed in-class unit exam, Option 2 automatically will be utilized to determine the final course grade. Any subsequent missed in-class exams will be scored as zero. The student must have a valid and verifiable reason for missing the final exam, such as an extreme emergency or serious illness requiring hospitalization, and so forth, to be eligible for a make-up final exam. A make-up final exam will be in a different format. If a verifiable and valid reason cannot be provided, a zero score for the final exam will be recorded. See attached schedule. Exam Dates (tentative):

EXAM I: Tuesday, February 16; EXAM II: Tuesday, March 22; EXAM III: Tuesday, April 19;

FINAL EXAM: Saturday, May 07, 04:15 PM – 06:15 PM

Final course grade assigned: A: 100% – 87.0% A- : 86.9% - 83.0% B+: 82.9% - 79.0%

B: 78.9% - 75.0% B-: 74.9% - 71.0% C+: 70.9% - 67.0% C: 66.9% - 63.0% C-: 62.9% - 59.0%

D+: 58.9% - 55.0% D: 54.9% - 51.0% F: < 51.0%

Students are not allowed to leave during exams. If you leave, you must turn in your exam and you will be considered finished with the exam. Students cannot begin an exam and decide not to complete it. Students must turn in all exam materials when finished. Exams cannot be taken from lecture: see Academic Integrity Violations. Students must bring and present their Loyola I.D. for each exam: Exams will not be distributed to any student without proper Loyola ID.

Student Conduct: Only students officially enrolled may attend any component of the course. Students must attend the specific discussion for which they are officially enrolled. At all times students are expected to conduct themselves in a mature and professional manner, which includes but is not limited to: treating everyone in class with courtesy and respect, avoidance of extraneous comments and small group discussions during lecture. Eating, chewing gum/tobacco products and drinking (food items) are not allowed at any time unless medical documentation is provided. Students are expected to take care of their personal/professional matters before lectures/discussions/exams. Additionally radios, headphones, cell-phones or similar devices must be in silent mode and are not permitted during lectures/discussions/exams. If a cell phone rings (beeps, buzz, etc.) during discussions or lectures, the student will be asked to leave. Not all contingencies can be listed but inappropriate conduct will be addressed. If a cell phone rings (beeps, buzz, etc.) during any exam, the exam will be collected and the student will not be allowed to continue, since this constitutes using an outside resource: See Academic Integrity. Students are expected to take care of any professional/personal issues before the exams. Students are not allowed to leave the room during exams until their exam is handed in for grading. If you leave, you must turn in your exam and you will be considered finished. Please keep noises and sounds to a minimum. When leaving, be respectful and leave quietly. During exams, only religious caps/ hats/hoods are allowed: nonreligious caps, hats, hoods, visors and so forth, will not be allowed to be worn during exams. All personal materials, besides pencils, calculators and erasers, will be put away. Other exam instructions will be given and thus it is expected that students will be on time and ready for the start of the exam. The visual or audio recording of the lectures and discussions is not allowed generally but exceptions can be made for extraordinary circumstances.

Academic Integrity: Although discussion handouts may be completed outside of the scheduled discussion time frame, anything submitted that is incorporated as part of the student's grade in this course must represent your own work. All exams are closed book and closed note and are subsequently self-contained. No external materials/notes/books or personnel are allowed: no unauthorized resources. Regular HB or #2 pencils, additional graphite for mechanical pencils, erasers, calculators (batteries) are the only materials allowed to be used during exams. During exams, violations include but are not limited to: cell phone ringing,

answering/using a cell phone, using unauthorized notes or books, looking at another student's exam, talking to other students, opening and/or utilizing anything in your book bag without the instructor's consent, and so forth. Consult the Undergraduate Studies Handbook for additional information. All students in this course are expected to have read and to abide by the demanding standard of personal honesty, drafted by the College of Arts & Sciences, which can be viewed at: http://www.luc.edu/academics/catalog/undergrad/reg_academicintegrity.shtml (For on-line homework submitted for grading, students creating multiple accounts will be considered in violation of academic integrity). Students caught cheating will receive a zero score for the exam and this exam will not be allowed to be dropped: Option 1 above will automatically apply. Further actions will also result. Any student found to be in violation or cheating will, at minimum, be given a zero for the assignment component/exam and penalty up to failure of the course, and the incident will be reported to the Chemistry Department Chair and the Office of the CAS Dean. Depending on the seriousness of the incident, additional sanctions may be imposed.

Course Practices Required:

Attending all lectures and discussions on time; College-level writing skills on exams; Communication skills for discussion and articulation of questions; Completion of homework and reading assignments. It is recommended that the student read through each chapter before lecture and eventually work through the suggested problems.

Learning Objectives:

Course introduces bio- molecule monomers, macromolecules, and processes found in living organisms. Content includes structures of amino acids, nucleotides, lipids, and sugars; corresponding macromolecular structures, i.e., proteins, nucleic acids, membranes, and polysaccharides as related to their biological functions; kinetics and mechanism of enzymatic reactions, the central metabolic pathways, the genetic code and developments in biotechnology. Students who successfully complete this course will be able to do the following, at an acceptable level (including but not limited to): Identify and describe biomolecules including carbohydrates, amino acids/proteins and nucleotide/nucleic acids, lipids/lipid bilayer constituents, Choose appropriate buffer system; calculate the ratios of weak acid to conjugate base; determine the pKa value from the associated titration curve; Show the major form of an amino acid/polypeptide including the zwitterion, at different pH values; track the fate of an oxygen molecule from inhalation in the lungs, track the fate of a carbon dioxide molecule produced from the TCA cycle, identify the kinetics of an enzymatic process; identify the substrates, enzymes and products in both catabolic and anabolic metabolism; track the fate of pyruvate and acetyl-CoA through the TCA cycle; track the fate and path of two high-energy electrons through the electron transport complexes/respiratory chain, in conjunction with the Chemiosmotic principle of proton translocation utilized in oxidative phosphorylation to synthesize ATP; B-oxidation of Fatty acids to yield ATP.

Disability Accommodations: Students requiring accommodations at the University need to contact the Coordinator of Services for Students with Disabilities. The instructor will provide accommodations only after receiving official documentation from SSWD and allowance of a reasonable time frame for arrangements (minimally, one week in advance). Accommodations cannot be retroactive. Information is available at: <http://www.luc.edu/sswd/>

Important Dates:

Monday, January 18: No Classes: Holiday (Dr. Martin Luther King)

Monday February 15: Summer 2016 Registration

Monday - Friday, March 07 – March 11: Spring Break, No Classes

Monday, March 28: "W" day

Thursday-Monday, March 24 – March 28: Easter Holiday: Thursday: No classes held after 04:15 PM;

Monday: Classes beginning after 04:15 PM are held

Saturday, April 30: End of term

Lecture Outline (tentative / subject to change)

Week	Date	Chapter	Topic
01	T 01/19 R 01/21	01 02	Introduction Water and pH; Buffers; Henderson-Hasselbalch equation
02	T 01/26 R 01/28	05 06	Introduction to Proteins: The Primary Level of Protein Structure The Three-Dimensional Structure of Proteins
03	T 02/02 R 02/04	06 07	The Three-Dimensional Structure of Proteins Protein Function and Evolution
04	T 02/09 R 02/11	07 05, 06	Protein Function and Evolution Tools of Biochemistry: Amino Acid/ Protein purification
05	T 02/16 R 02/18	 08	EXAM I Enzymes: Biological Catalysts
06	T 02/23 R 02/25	08 09	Enzymes: Biological Catalysts Carbohydrates
07	T 03/01 R 03/03	04 10	Nucleic Acids Lipids, Membranes and Cellular Transport
08	T 03/08 R 03/10		NO CLASS SPRING BREAK NO CLASS SPRING BREAK
09	T 03/15 R 03/17	03 11	The Energetics of Life Chemical Logic of Metabolism
10	T 03/22 R 03/24	 12	EXAM II Glycolysis (Classes after 04:15 PM <u>not</u> held)
11	T 03/29 R 03/31	13 20	Citric Acid Cycle (Krebs Cycle; Tricarboxylic Acid Cycle) Electron Transport, Oxidative Phosphorylation
12	T 04/05 R 04/07	20 12	Electron Transport, Oxidative Phosphorylation Glycogen Metabolism, Gluconeogenesis
13	T 04/12 R 04/14	12 16	Pentose Phosphate Pathway Lipid/ Fatty Acid Metabolism
14	T 04/19 R 04/21	 18	EXAM III Amino Acid & Nitrogen Metabolism
15	T 04/26 R 04/28	17 20	Integration of Metabolism Signal Transduction
16	FINAL EXAM: Saturday, May 07, 04:15 PM – 06:15 PM		

The instructor reserves the right to amend any of the constituents, requirements and policies of this syllabus at any time.