

**TENTATIVE SYLLABUS for Chem 4600, Fall 2019**

**As on August 15, 2019... If changes are needed, changes will be made.**

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**Prerequisites:**

- 1) Two semesters of General Chemistry AND
- 2) Two semesters of Organic Chemistry

**Lecture:** MWF 5:30 – 7:00 pm, Room LIBS102;

**Office Hours:** Monday, Wednesday 3:00– 4:30pm or by appointment. Students are required to bring specific questions in writing and their lecture notes. **I am not available at all on Tuesdays and Thursdays (10-1;00pm) as I teach CHEM 1152.**

**Textbook :** "Biochemistry, 8<sup>th</sup> or 9<sup>th</sup> Edition ", Jeremy M. Berg, John L. Tymoczko, Lubert Stryer (Freeman, 2019).

**Course Objective:** A comprehensive and integrated review of modern biochemistry with emphasis on enzymes, nucleic acids and metabolism of carbohydrates and lipids.

**Projected Grading Scale:**

**A+ : 96% A: 90%; A-: 87%; B+: 84% B: 80% B-: 77%, C+: 74% C: 70% C-: 66%, etc.**

**Points distribution**

(Best 4) of 5 exams -@ 90 points	360 points
On line quizzes*	140 points
Final exam	150 points
<b>Total points</b>	<b>650 points</b>

Unannounced quizzes-in class max- 60 bonus points

\*This is a hybrid course: a high percentage of resources are available in ICollege, also quizzes. Icollege platform allows to assign 1 point or more per question. I will give you many questions to prepare students for in class exams- You have to study before taking on line quizzes- Questions are highly randomized from a large pool or database of my own questions. No two students will get the exact same set of questions, to keep the integrity of assessments. Quizzes are timed. Doing on line quizzes with an open book could give a student a false feeling of confidence of "I know the material". In reality, those students could fail the tests "in class" as those are closed book. The best way to prepare for exams is by studying problems from your textbook or worksheets.

**Miscellaneous:**

- **Class Preparation:** Suggested reading assignments should be completed before the each lecture. To study is not the same than to learn. **To study is short term, learning is long term. When you prepare yourself as if you have to teach the topic to a classmate or a friend or in front to the class: That is learning. If you learned chapters 19-23 well during 2410 Organic chemistry II: congratulations- that foundation will help you during discussion of mechanisms. Studying the night before tests alone does not work.**
- When sending an **e-mail to Dr. Navarro-Eisenstein, under the subject heading**, please state in which class you are enrolled. (i.e., CHEM 4600)- Chemistry is not enough information. It

is important you email to [anavarro@gsu.edu](mailto:anavarro@gsu.edu) from your GSU account to receive a prompt response. **If you email Dr. Navarro from Icollege, I will only reply your email when I access to enter grades.** Please, do not e-mail through Gmail, Hotmail, Yahooh etc. as your message could go to spam. I will email the class from GSU mass collective emails. If the subject does not apply to you, please ignore it.

- **Preparation for the course:** Read the chapter to be discussed before you come to lecture. Work the problems at the end of the chapters. You know what you know when you answer the questions with the closed book. Exams are closed book. Previewing solutions to problems gives a false sense of confidence about the subject matter, and typically results in poorer test scores.
- **Planning ahead is a key to success. Your performance in science is a lot better when you study daily.** Do not wait until the night before the exam to begin studying. **You will EARN a grade in correlation with your efforts and good study habits.** As you read the material, you should take written notes and **underline**. Use **highlighters** or **color pens**. That will help you throughout the semester and to study for finals.
- **Make-ups:** There is no chance for make ups due to time constraint. Plan accordingly.
- **Academic Honesty:** The honor code embraced by universities expresses an ideal of character, conduct, and citizenship. This applies especially to academic honesty and integrity. Passing off someone else's work as your own represents intellectual fraud and theft, and violates the core values of academic community. You will be asked to sign up the honor code in bold as written beneath, along with your printed name on the first page of assessments. **"As a member of the student body taking this course, I consider myself bound, guaranteed and compelled by honor to develop and uphold high standards of honesty and behavior."**
- **Attendance:** Students are expected to attend all lectures. As a courtesy to your fellow students, please arrive on time and do not leave during the lecture. **Please bring me a schedule of your RELIGIOUS HOLIDAYS OBSERVANCE the SECOND WEEK of class.**
- **Disabilities: Students who wish to request accommodation for a disability** may do so by registering with the Office of Disability Services. Students may only be accommodated upon issuance by the Office of Disability Services of a signed.
- **Accommodation Plan:** Students are responsible for providing a copy of that accommodation plan to instructors of all classes in which an accommodation is sought. Your need for accommodations will only be discussed in the office and never at the beginning or end of class **and never in front of classmates.**
- **Electronic devices:** Students are requested not to leave cellular telephones and/or I pads or tablets on their desks during assessments. Cell phones and laptops are allowed during lectures, BUT NOT during quizzes or exams
- The University requires that faculty members must, on a date after the mid-point of the course to be set by the Provost (or his designee): A) **Give a WF** to all those students who are on their rolls but no longer taking the class and B) **Report the last day** the student attended or turned in an assignment.
- Students need to **show their GSU Panther ID card when taking any test, quiz or exam.** All tests/exams are taken in class. The basic ideas and principles on these exams come from the book and lecture material and are designed to test a student's 1) understanding of the concepts and 2) ability to solve problems, as well as 3) knowledge of the facts.

- Research shows that the more **different ways** you present information to the brain the easier it is to learn. In other words **hear it, see it, say it, write it, practice it, highlight it, quiz it**, etc.
- In general, questions and problems on exams will be original and not copied from those found in a chapter of the textbook or old previous exams given. Don't waste time memorizing answers from old exams as the instructor modifies questions every semester. Exams are designed so that the majority of questions are of medium difficulty, some are relatively easy and very few are challenging.
- Major tests and the final exams will be multiple choices (green scantrons). Missing any exam will result in the assignment of a zero for that exam, in either the lecture or the laboratory. **NO MAKEUP EXAMS ARE GIVEN. Exams cannot be taken earlier or later than day scheduled. Students missing an exam will be expected to submit a written note explaining why the exam was missed, to provide valid evidence for that excuse and to discuss absence in the office, no in front of the class.**
- Any student presenting falsified documentation will receive an "F" for the course and be referred to the Chemistry Department Chair or Dean of Students for disciplinary action.
- The lecture professor may retain copies of students' homework, quizzes or tests. Exams are kept in my office and students can stop by to check on missed questions with the marked scantrons and keys.
- **Class Preparation: The price of success** is high. Anything of value requires great effort. You have to work hard, be persistent, and pay attention to details. These traits are ultimately why a college degree is valuable, plus the capacity to learn. **Believe you can succeed.** Be willing to pay the price. **Accept responsibility for your learning!** It is your choice. I could be the best teacher in the world but your performance depends only on the time and effort you invest in this course. Chemistry is a highly structured subject in which each new topic is based on others previously discussed. Therefore, if one topic is not mastered, it becomes *increasingly* difficult to master those that follow. **Missing even one class can lead to problems** that the average student cannot overcome. Also, chemistry does not lend itself to "cramming". What you learned from the first chapter is needed for the second; what you learned from the third chapter will be needed the last day. Complex concepts build up from beginning chapters. **Attend all lectures!** The quizzes and exams are based mostly on material that is covered in class. You must be present to know what is going on.
- **Believe you can succeed.** Be willing to pay the price. Accept responsibility for your learning! There is not a formula for excellence, but effort is probably the most value fact required to achieve goals.
- **Be motivated, I do have passion for Biochem and wish you develop some appreciation for all the events taking place in our bodies "at the molecular level".**
- **The price of success is high.** For some students chemistry is easy, but for the majority it is not. Come to this course with your mind set for lots of work. Anything of value requires great effort. You have to be persistent, and pay attention to details.
- **"The mind is not a vessel to be filled, but it is a fire to be ignited" Plutarch.** If you have made it this far is because you are talented. **Dare to ignite your mind in this class. Study daily; don't wait to the last minute. Make wise choices, think!** I know all my students

not necessarily like my field, but if you are registered for this course, you probably need it. Get the picture, there is not time to go fool around, take it seriously.

- **The structure study time- Read your lecture notes but don't forget to explore the book. I open the book to make multiple choices.** The study time is set for a regular time and occurs in a regular place EACH DAY: The study time lasts at least 90 min, three sections of 30 min with a 10-15 min. breaks. Make summaries, diagrams, read the caption for each picture, figure, and graph discussed in class.
- Students are strongly encouraged to download lecture notes from [ICollege](#) before coming to class. The lecture **visual aids** for the instructor and **are not intended** to be *"the only source of study"* for the students. **You need to study from the textbook for all exams.**
- **Three habits** will help in mastering each topic as it arises, and will reinforce the topics previously covered:
  - ✓ **Read** the assigned material *before* it is covered in lecture and watch my own Ipad videos. You can explore more in your own time but you might encounter the same topics with more details for higher level chemistry.
  - ✓ **Work** through the **example** and **practice problems** from the textbook within each assigned chapter or those I place in ICollege.
  - ✓ **Work** a large number and wide variety of problems *"as many end-of-chapter problems as possible"*. All in-chapter examples and practice exercises should be done. To reward your hard work I might use some of the problems from your book for exams and quizzes.
- The instructor may assign or re-arrange seating at any examination or quiz. Please leave first row empty during all examinations.
- The instructor may take up an examination or quiz from any student who is behaving in such a manner as to disrupt the class during the examination or quiz, and assign a grade of zero to that student for that exercise. Such disruptive behavior includes looking around oneself or talking. Even if you are not copying, any form of looking around, neck stretching, gesturing or talking is unacceptable /considered inappropriate testing procedure, and will result in a zero score for the exam plus subsequent disciplinary action. **Hats need to be removed or turned around.** Students who feel they must move around during these times can apply for special testing privileges through the GSU Department of Disability Services.
- The Instructor reserves the right to move students during the tests. During all exams, sit up straight and keep your paper directly in front of you and out of sight from other students.
- Before an exam is given to the students, there should be nothing on your desk except pencils, erasers, a scantron, and ID (scratch paper will be provided if necessary). Students are required to show (and leave) their student identification on the desk in order to take the test. Tests will be graded ONLY if a student I.D. is shown. Write your name, student ID number and exam color/ or exam letter (A or B or C) on your scantron and set your ID out to be checked after completion of the tests when you and the scantron to the instructor.

- Answer sheets, scantron and exam papers should be completely covered throughout all assessments. If your paper or scantron can be seen, then you are a participant in cheating and **ALL participants will face disciplinary action**, which may include a failing grade for the entire course.
- **The Final Exam. It is mandatory** and it will not be dropped under any circumstance. The lowest 100 points exam score will be dropped, however you must get prepared for all four exams as all 4 exams material will be part of the final exam.
- **Make up Policy** If you miss a class exam for any reason, that is your dropped grade. You are responsible for withdrawing before the deadline if you need to do so. If more than one exam is missed for legitimate reasons, you should **seek a hardship withdrawal**. If you do not withdraw and miss the final exam, or more than one class exam, then zeros will be assigned for these grades. No make-up exams will be given under any circumstance. Office hours are canceled on days of 6 major Exams
- **Classroom etiquette:** As a courtesy to your classmates, please **turn off all cell phones and electronic devices** during class. Please **refrain from texting, chit-chat** during class, as it distracts not only the students who sit around you but also the instructor. Disruptive conduct during class will not be accepted and **appropriate action will be taken** (refer to your copy of the Student Conduct Code).
- Students will not have permission to **use your cell phone as a calculator or SMART/Apple watch during assessments**. If you need to be on-call during an exam, you can turn your cell phone to "vibrate" and leave it up front with the instructor.
- Use the restroom and complete any other personal business **before coming to an exam**. Bring tissues in case you need them. Students may leave the room only after their exam has been turned in. Leaving the room during any testing procedure will result in a score of zero for the exam.
- Students arriving late to exams will not have any additional time. Make sure you take into consideration Downtown's heavy traffic.
- **Cancellation of Classes:** Official closure of the university is determined by the university administration. This sometimes occurs due to inclement weather, in which case notification will be made through local radio and television outlets.
- Should closure result in cancellation of classes or examination periods, resumption of the missed activities would occur at the next regular class period when the university reopens, or as determined by the course instructor. Should an instructor be unable to meet a class for reasons other than those above, another instructor would normally meet the class as scheduled. Be hereby advised, however, that on rare occasions conditions could require the cancellation of class or examination periods. In such cases, there would be *official* notification of the students affected via email, text message and the local news. Should this notification be through notices posted in the classroom or other means, the *student* has the final responsibility of confirming the authenticity of the cancellation through the Chemistry Department Office.
- **Each student has the responsibility of checking their email and iCollege on a daily basis.**
- **Prohibited Accessories:** Students may **NOT** use a **cell phone** as a timepiece or calculators during exams, or any such transmitting equipment (e.g. **Bluetooth, MP3,**

**laptop, ipod, iphone, ipad).** They are all strictly forbidden during any test or exam. Electronic calculators are not needed in this course, only for the lab portion.

- **Classroom etiquette:** Please do not reserve a seat for your friends coming late. Please **refrain from chit-chat** during class as it distracts not only the students who sit around you but also the instructor. Disruptive conduct during class will not be tolerated and **appropriate action will be taken against you** (refer to your copy of the Student Conduct Code).
- **Cheating:** All tests taken must represent your individual, unaided efforts. To receive or offer information during an examination is cheating. The use of unauthorized supplementary materials during tests is also cheating. A student who cheats on an exam will receive **a zero for that exam which cannot be dropped as the lowest grade**. Any suspected offenses may also be referred to the Department Chairman and/or the Dean of Students for appropriated disciplinary action. The Department of Chemistry follows the university policy on academic honesty published in the "Faculty Affairs Handbook" and the "On Campus: The Undergraduate Co-Curricular Affairs Handbook."

**Georgia State University Student Conduct and Integrity Policy:** *The Georgia State University Policy on Academic Honesty* is applicable to this course, including but not necessarily limited to infractions in the areas of **plagiarism, cheating on examinations, unauthorized collaboration, falsification, and multiple submissions**. This policy is published in *On Campus: the Student Handbook*, available to all members of the university community. Supplementary source material (handbooks, reference literature, etc.) must be *clearly referenced* (title, author, volume, page(s), etc.). Falsification or destruction of data constitutes cheating. **Conduct or actions that disrupt class, examination, or laboratory periods or falsification of information related to chemistry courses by any student** will be taken as a violation of the policies of the Board of Regents of the University System of Georgia and the Georgia State University Student Code of Conduct, Section 6.0. Any suspected offenses may be referred to the Department Chair.

<p><b>Some Examples of Unacceptable Student Conduct:</b></p> <ul style="list-style-type: none"> <li>✓ Leaving class before the lecture is over</li> <li>✓ Leaving class after taking a quiz or turning a homework</li> <li>✓ Talking while your professor is lecturing distracting your fellow classmates</li> <li>✓ Arguing with the professor about student conduct</li> <li>✓ No following the testing procedures as listed in this syllabus</li> <li>✓ No sitting up straight with paper directly in front of you during a quiz or exam or no keeping scantron covered</li> <li>✓ No having your student ID for a quiz or test</li> <li>✓ Letting your cell phone ring audibly during a lecture or exam or having a cell phone available during a quiz or test</li> <li>✓ Using a disrespectful tone of voice, harsh words</li> <li>✓ Using profanity or making inappropriate gestures of any kind</li> </ul>	<p><b>Profile of the A/B student after Dr. Terry L. Fry</b></p> <p>Note: This checklist might be used by students to determine why they are or are not attaining their desired goals in class. Past students have contributed items to this list which they believed were characteristic of A/B students</p> <p><i>Attends to school regularly</i>  <i>It is not tardy to class</i>  <i>Always writes down homework assignments</i>  <i>Does homework fully and completely (neatness counts)</i>  <i>Does make up work promptly after an absence</i>  <i>Is well organized</i>  <i>Schedules a regular study time</i>  <i>Comes to class prepared (books, paper, pencil, homework)</i>  <i>Pays attention in class (does not sleep or goof off)</i>  <i>Asks questions in class</i>  <i>Participates in class discussion</i>  <i>Develops good concentration (don't study with music or TV on)</i>  <i>Is courteous to others (does not distract students and instructor with cell phone or lab top)</i>  <i>Takes good lecture notes</i>  <i>Does not allow problems unrelated to school affect school work</i>  <i>Does extra work without expecting a grade</i>  <i>Sets and achieve goals and cooperates with the instructor</i></p>
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**APPENDIX-TENTATIVE SCHEDULE OF ACTIVITIES: The schedule below is only tentative and it is subject to changes if needed**

<b>BIOCHEMISTRY 4600/ TENTATIVE LECTURE SCHEDULE- FALL- 2019</b> This schedule is a general guide and may be modified as needed. Always read the chapter and slides before the lecture. I expect you to read and do ALL assignments before coming to class. Study Daily, as there is a lot of information to master "JUST DO IT"		
Date	Topics:	Reading Assignment ahead of lectures
8/ 26-Mon	From GEN CHEM – <b>chapt-1.3-</b> Introduction to the course, covalent and non covalent bonds, Chemistry of water, acid-base reactions, pH	Review from your general chemistry book acids, bases, pH, properties of water and hydrogen bonds. <b>Read chapter 1 1.3 Concepts from Chemistry Explain the Properties of Biological Molecules and 2, underline your book!</b>
8/28 Wed	<b>Chapt 2</b> Amino Acids, Protein Composition and Structure	Memorize the structures of 20 amino acids, along with their 3-letter abbreviations, write the structure 10 times each in construction paper, after that use flash cards, you have to learn them before you can memorize them..
8/30 Fri	Chapt 2-Protein Composition and Structure	Study the ionization states of all AA ionizable groups at pH's above and below their pKa's. You need to know how the groups on the side chain are affected with minute changes in pH. (alpha amino and alpha carboxyl groups, the side chains of arginine, histidine, lysine, aspartic acid, glutamic acid, cysteine, and tyrosine <b>Work problems Chapt. 2 (7, 11, 12)</b> )
9/2 Mon	<b>Labor Day</b>	<b>Read chapter 3 underline your book!</b>
9/4 Wed	<b>Chapt- 2/3</b> Exploring proteins	<b>Write distinct facts of primary, secondary, tertiary and quaternary structures. Make a chart to distinguish between <math>\alpha</math>-helix, <math>\beta</math>-pleated sheet. How are collagen and keratin different? Read chapter 3 underline your book!</b>
9/6 Fri	<b>Chapt-3</b> Protein Characterization and Purification	<b>Continued study of techniques- Watch YOUTUBE video links are provided in Icollege-Make a list of each technique used in purification and characterization of proteins and their basis (column chromatography, electrophoresis, ultracentrifugation, mass spectrometry etc).</b>
9/9 Mon	<b>Chapt-3</b> Protein Characterization and Purification,	<b>Read chapter 7, underline your book!</b> make two lists: First one about the similarities and the second one about differences between myoglobin and hemoglobin (structure, function, allostereism, Hb, Bohr effect). Make a list of factors that increase or decrease affinity for oxygen
9/11 Wed	<b>Chapt-7</b> Myoglobin (Mb) and hemoglobin (Mb)	<b>Review from chapter 1-7 slides, read ALL "END OF THE CHAPTER SUMMARIES" and underlined parts of your book If you want to watch my videos go to YOUTUBE- use my CHEM1152- as an intro- you need more info than that. Read the book!</b>
9/13 Fri	<b>Chapt-7</b> Myoglobin (Mb) and Hemoglobin (Hb)	<b>Study from notes, worksheets and slides for exam I Chapters: 1.3, 2, 3, 7 (First 9 lectures)</b>
9/16 Mon	<b>Exam I</b>	<b>90 points Chapters: 1.3, 2, 3, 7 (First 9 lectures)</b>
9/18 Wed	<b>Chapt-1.1-1.2 and chapter 4</b> Introduction to DNA and RNA	<b>Read chapter Chapter 1.1-1.2</b> <b>And chapter 4, underline your book!</b>
9/20 Fri	<b>Chapt-4</b> Introduction to DNA, and RNA	<b>Work problems Chapt. 4- (1, 13, 19)</b> Study the structures of the five most common nitrogen bases, A, T, G, C, and U, for exam II

9/23 Mon	Chapt 5.1-5.3	DNA Exploring genes/ Sanger and PCR <b>Chapter 8-</b> introduction
9/25 Wed	<b>Chapt 8-</b> Introduction to enzymes	Review Chapt 1.3. Entropy and the law of thermodynamics to understand how enzymes work. <b>Read chapter 8, underline your book!</b>
9/27 Fri	<b>Chapt 8-</b> Enzymes: Kinetics and Inhibition	Derivation of Michaelis-Menten equation, Km, Vmax, Kcat, T.O.N. (turnover) <b>Work Chapter 8 problems from 1 to 5</b>
9/30 Mon	<b>Chapt-9-</b> Catalytic Strategies	<b>Read chapter 9, underline your book!-</b>
10/2 Wed	<b>Chapt-9-</b> Catalytic Strategies	<b>Read chapter 9</b>
10/4 Fri	<b>Chapt-10</b> Regulatory Strategies October 15 is the Midpoint-coming soon	<b>Read chapter 10-</b> -Last day to withdraw and possibly receive a W without penalty!!!! <b>WORK HARD to Be successful</b>
10/7 Mon	<b>Chapt 10</b> Regulatory Strategies	Review from slides, read ALL "END OF THE CHAPTER SUMMARIES" and underlined parts of your book
10/9 Wed	<b>Exam II</b> <b>Last 9 lectures</b>	<b>Exam II 90 points Chapters, 4,5,8,9,10-</b> After exam II Review from organic chemistry oxidation of aldehydes to carboxylic acids and acetals and hemiacetals, Keto-enol tautomerism <b>Read chapter 11</b>
10/11 Fri	<b>Chapt 11</b> Carbohydrates	Practice (memorize, I hate that word) the structures of glyceraldehyde, dihydroxyacetone, ribose, glucose, galactose and fructose (open chain and cyclic structures)
10/14 Mon	<b>Chapt 11</b> -Carbohydrates/ maybe 12- /lipids intro	Read chapter 12-lipids intro- Tomorrow is midpoint- <b>If you are failing please talk to your advisor- consider to withdraw from this course today</b>
10/16 Wed	<b>Chapt-12-</b> Lipids and Membrane Structures (1)	<b>Practice the basic structure of a glycerophospholipid and sphingophospholipid, and a glycolipid</b>
10/18-Fri	<b>Chapt-12-</b> Membrane Structures and Lipids (2), metabolism/intro	<b>Read chapter 15 Review from organic chem. the aldol condensation and how decarboxylation works. List the name of all enzymes involved in glycolysis -List all the chemical changes taking place during glycolysis by name- no structures</b>
10/21-Mon	<b>Chapt-15</b> /Metabolism: Players- Basic Concepts	<b>Read chapter 16</b> Write down the glycolysis pathway 5 times, only the reactants and main products, <b>with structures</b> observe the chemical changes required to generate highly phosphoryl transfer molecules
10/23-Wed	<b>Chapt-16-</b> Glycolysis: metabolism of glucose	<b>Read chapter 16</b> Write down the glycolysis 5 times, now include all enzymes, and by-products; pay close attention to generation of energy as ATP, or as electrons carried (i.e. NADH)
10/25-Fri	<b>Chapt-16</b> / Glycolysis regulation and Metabolism of Fructose, galactose, Fates of pyruvate, regulation	Review from <b>11, 12, 15, 16</b> slides, read ALL "END OF THE CHAPTER SUMMARIES" and study underlined parts of your book <b>Chapters: 11, 12, 15, 16- last 8 lectures</b> Exam III
10/28-Mon	<b>Exam III Last 8 lectures</b>	<b>90 points -After exam III, Read chapter 16 Gluconeogenesis</b>
10/30-Wed	<b>Chapt-16</b> / Gluconeogenesis, Cori cycle	<b>In gluconeogenesis, pay close attention to the initial steps-new enzymes-are needed to make glucose from non carbohydrate sources</b>



11/1-Fri	<b>Chapt 17</b> CAC-	Pyruvate Dehydrogenase Complex/ Mechanism of pyruvate decarboxylation- review organic chemistry
<b>11/4 -Mon</b>	<b>Chapt 17-</b> CAC	<b>Read chapter 18 From General Chemistry, (2) review the use of standard reduction potential and electrochemistry</b>
11/6-Wed	<b>Chapt-18-</b> ETC	List the names of enzymes and electron carriers
11/8 Fri	<b>Chapt-18-</b> ETC	Practice the function of the coenzymes used in ETC
<b>11/11-Mon</b>	<b>Chapt-18 –</b>	Oxidative phosphorylation
11/13-Wed	<b>Chapt-18 –</b>	Cont. Oxidative phosphorylation
11/15-Fri	<b>Exam IV</b> <b>Part of Chapt 16, 17, 18</b>	<b>90 points Last 7 lectures Gluconeogenesis, CAC, ETC, Ox. Ph.</b>
<b>11/18-Mon</b>	<b>Chapt-20-</b> PPP-	<b>From 20.3 Pentose Phosphate Pathway to the end of chapter</b>
11/20-Wed	<b>Chapt-20-</b> PPP	Pentose Phosphate Pathway
11/22-Fri	<b>Chapt-21-1- to- 21.4</b> Glycogen metabolism-	just the overview <b>Biosynthesis of glycogen 21.4 -intro</b>
<b>11/24-</b>	<b>Thanksgiving to 11/30</b>	<b>NO- SCHOOL-- ENJOY YOUR BREAK</b>
<b>12/2 Mon</b>	<b>Chapt-21.4 -</b> Glycogen biosynthesis	
12/4 Wed	<b>Chapt-22-</b> Fatty Acids Metabolism	<b>22-1- to- 22.2</b>
12/6 Fri	<b>Chapt-22-</b> Fatty Acids Metabolism	
<b>12/9 Mon</b>	<b>Exam V</b>	<b>90 points - Part of Chapt 20, 21, 22 Last 6 lectures and day of class</b>
<b>Reading days</b>	<b>From Dec-10 –to Dec 13</b>	<b>Office hours by appointment only</b>
<b>12/16 Mon</b>	<b>Cumulative FINAL EXAM</b>	<b>150 points From 4:15 TO_6:00 PM, SAME CLASSROOM</b>