

Course:	Biochemistry 2 – CHE 262
Term:	Spring 2012
Instructor:	Name: Dr. D. R. Buffinger Email Address: dbuffing@wilberforce.edu Phone Number: (937) 708-5639
Catalog Description:	A continuation of course CHE 261 with emphasis on photosynthesis, lipid metabolism, amino acid metabolism, nucleic acid metabolism, DNA and RNA chemistry, and protein synthesis.
Prerequisites	<i>CHE 261</i>
Course Level Learning Outcomes:	<p>After completing this course, students will know or be able to demonstrate the following:</p> <ol style="list-style-type: none"> 1. Be able to explain how gluconeogenesis differs from glycolysis 2. Be able to name and draw the structures for the five precursors for gluconeogenesis 3. Be able to write the balanced equation for the pentose phosphate pathway 4. Be able to explain the difference between the oxidative and non-oxidative stages of the pentose phosphate pathway 5. Be able to draw the structure of the pentose phosphate formed at the end of the oxidative stage of the pentose phosphate pathway 6. Be able to draw the structures of the two pentose phosphates that are formed at the beginning of the non-oxidative stage of the pentose phosphate pathway 7. Be able to state the three hormones that affect glycogen metabolism 8. Be able to state the main differences between the light and dark reactions in plants 9. Be able to explain how the two photosystems function 10. Be able to draw the Z-scheme to show the general path of the electrons and the major components of photosynthesis 11. Be able to describe the role of the major enzyme of the Calvin cycle 12. Be able to describe the three stages of the calvin cycle

	<ol style="list-style-type: none"> 13. Be able to describe the structural features of triacylglycerols, phospholipids, glycosphingolipids, and isoprenoids 14. Be able to describe the fluid mosaic model of a cellular membrane 15. Be able to describe the three major classes of membrane proteins and how they can be separated from the membrane 16. Be able to describe the general mechanism of signal transduction and how G proteins are involved in the mechanism 17. Be able to describe the events occurring in the three stages of fatty acid degradation 18. Be able to describe the events including drawing structures for the four steps in Beta oxidation of a typical saturated fatty acid 19. Be able to describe what happens including drawing structures in each step of the five steps of fatty acid synthesis 20. Be able to explain how organisms overcome fatty acid chain length limitations 21. Be able to describe eicosanoids and what affects they have on an organism 22. Be able to describe the nitrogen cycle 23. Be able to explain how ammonia is assimilated into glutamate or glutamine 24. Be able to explain how transaminases use the cofactor PLP 25. Be able to state the six amino acid families and the members of each family 26. Be able to describe the urea cycle 27. Be able to explain the purpose of the Glucose-Alanine cycle 28. Be able to draw the structures of the purine and pyrimidine bases 29. Know the key control site for purine base synthesis 30. Know the key control site for pyrimidine synthesis
Materials:	<p><i>Principles of Biochemistry</i>, 4th edition by Horton, Moran, Scrimgeour, Perry and Rawn</p> <p>A scientific calculator</p>
Grading:	<p>Grading Scale</p> <p>90 - 100% = 470 – 525 pts = A 80 - 89% = 417 – 469 pts = B 70 - 79% = 365 – 416 pts = C 60 - 69% = 312 – 364 pts = D Below 60% = 0 – 311 pts = F</p>

	<p>3 Exams (100 pts each) 300</p> <p>1 Presentation (100 pts) 100</p> <p>1 Comprehensive Final Exam (100 pts) 100</p> <p>35 Class Participation/Attendance Points <u>25</u></p> <p style="text-align: right;">525</p>

	<p>A student's proficiency in course work is measured in terms of the following Alphabetical symbols. Minuses and pluses are not accepted.</p> <p>A: Excellent</p> <p>B: Good</p> <p>C: Satisfactory (Grade C or better required in major courses).</p> <p>D: Poor (passing, except in major courses).</p> <p>F: Earned Failure. (Removed only by repeating the course). Upon successfully passing the course, the first grade is "excluded" from grade point average. The second grade is "included in the recalculation of the grade point average.</p> <p>I: Incomplete (student performing satisfactorily, but unable to complete coursework due to valid reason).</p> <p>N: Used in cases where grades are not yet submitted.</p> <p>W: Withdrew before course drop deadline.</p> <p>WP: Student withdraws from University. Withdrew passing after course drop deadline (2 weeks after mid-term).</p> <p>WF: Student withdraws from University. Withdrew failing after course drop deadline (2 weeks after mid-term. WF is treated as an F (punitive grade).</p> <p>CR: Credit/pass</p> <p>NC: No credit/fail</p> <p>Z: Failed course for non-attendance/unofficial withdrawal (treated the same as an F grade). Last date of attendance is reported by faculty.</p>
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Activities:	<ol style="list-style-type: none">1. There are four (4) tests used to assess your performance in this class. The lowest scored exam will be dropped at the end of the semester. Each exam is mainly multiple choice (80%) and short answer/problem solving (20%). Partial credit is often given so no question should be left blank.2. Students will be placed into 5 groups. Each group will be tasked in developing a presentation. Each group's topic must be finalized by the end of the second week of classes. A diagram of how the presentation will look, an outline of the text and a list of required materials must be submitted by the last week of February. The presentations will be installed the week we return from spring break. Grading will commence the Friday following spring break. The group with the best presentation will receive 10 bonus points on one of their examinations. The presentation will be evaluated by a panel of science faculty.
Policy Statements:	<ol style="list-style-type: none">1. All cell phones are to be either turned off or on vibrate during class. No cell phone is permitted to be answered during a lecture. If this policy is ignored, I will assess a reduction of two points from an exam for offenders. Cell phones are not allowed in class during exams. They must be off and stored in purses, backpacks, etc. Failure to abide by this rule will cause a penalty of 10 points to be removed from your examination.2. During examinations all electronic devices including i-pods, laptops, etc must off and stowed. The only exception is a calculator. Please note that you MAY NOT use your cell phone as a calculator.

University Policies:

Academic Honesty:

Plagiarism and cheating are completely unacceptable in an institution of higher education and learning. Such behavior deprives the student involved of the desired education and development of an appropriate value system. It is extremely unfair to other students, and it severely diminishes the value and integrity of a University degree.

Plagiarism occurs whenever another's work is submitted as one's own. This includes the use of information from an Internet site or from a published author's ideas and words without proper attribution or documentation. It also includes the copying of term papers, other unpublished works, homework, case reports, computer programs and spreadsheets, and any other course assignments which are submitted for course credit as the student's own effort.

Each instructor shall state the specific penalties for plagiarism and cheating in the course syllabus. The instructor has final responsibility for assessing the penalty in such cases regarding the course grade.

All cases of plagiarism and cheating will be referred to the Vice President for Academic Affairs for possible further action. Additional penalties may be imposed for the egregious cases of plagiarism and cheating.

	<p><u>Drops and Withdrawals</u></p> <p>Dropping Courses: A course may be dropped up through the end of the second week of the semester without any record on the transcript. After this date, a course may be dropped up to two weeks after mid-term grade reports are due, with a W appearing on the transcript. Withdrawals after mid-terms must be approved by the Vice-president of academic Affairs.</p> <p>In certain General Studies core courses, students' assignments to course sections may be changed by faculty with written notification given to the Registrar. In all other cases, a student wishing to move from one section of a course to another must accomplish this by using a drop-add form to drop the old section and add the new section.</p> <p>Withdrawal/Grading Policies The following procedures will apply to all students withdrawing from the University. Grades will be given in regard to the time of withdrawal. Contact the Registrar's Office for forms and assistance.</p> <ul style="list-style-type: none"> • W (official withdrawal initiated by the student): To be given when a student withdraws between the first day of class/registration and the last day to drop courses, this is two weeks after mid-term exams. • AW (unofficial withdrawal not initiated by the student): The student does not inform anyone that he/she is leaving campus (the student walks out). The university may also administratively withdraw a student for disciplinary reasons, academic legal anytime during the semester. <p><u>Special Accommodations:</u> A student who is ill or who has or develops medical conditions including but not limited to illness, physical or other disability or pregnancy must notify the Director of Health Services immediately.</p>
<p>Course Schedule :</p>	<ol style="list-style-type: none"> 1. This course meets from 4:00 to 5:15 MW 2. The new University Class Make-up Policy states that any missed class for whatever reason must be made up. For this course, any missed classes will be rescheduled for an agreed upon evening. 3. My Office Hours are as follows: <ul style="list-style-type: none"> MWF 1:00 – 1:50 MW 3:00 – 4:00 T 4:00 – 6:00

Course Policies :

1. There is a CD on reserve in the library that has all of my PowerPoint Lectures. You should copy each lecture's presentation. Please note that the presentations provide a framework for the discussion, but additional information/problems will be given in class. Therefore, these are not to be used in place of attendance in lecture.
2. You will be assigned specific sections of the text to learn independently from lecture. The best way to accomplish this task is to read the section, write a brief outline of the section and copy down any terms/conceptions with their definitions. I will assign specific homework to assist you in learning the material. The concepts in these sections will be on the exams. The reason for this is that I have a responsibility to prepare you to learn material on your own after you leave WU. If you have questions about the independent material, you must submit these in writing along with a copy of the section(s) outline and a glossary of new terms.
3. There are four (4) tests used to assess your performance in this class. The lowest scored exam will be dropped at the end of the semester. Each exam is mainly multiple choice (80%) and short answer/problem solving (20%). Partial credit is often given so no question should be left blank.
4. THERE ARE NO MAKE-UP EXAMS. NO EXCEPTIONS. This is why one exam is dropped at the end of the semester. The final exam cannot be dropped.
5. Students will be placed into 5 groups. Each group will be tasked in developing a presentation. Each group's topic must be finalized by the end of the second week of classes. A diagram of how the presentation will look, an outline of the text and a list of required materials must be submitted by the last week of February. The presentations will be installed the week we return from spring break. Grading will commence the Friday following spring break. The group with the best presentation will receive 10 bonus points on one of their examinations. The presentations will be evaluated by a panel of science faculty.
6. Attendance will be taken each day at the very beginning of the class. If you are not present, I will mark you absent. You may miss three days without any penalty. Please note that these three absences include excused absences. If you are going to be absent, please email me. Your class participation points are based upon attendance. After the fifth absence, your grade will be dropped one letter grade.
7. To succeed in this class, I recommend a minimum of two (2) study hours per hour of lecture. During this time you should rewrite lecture notes, prepare flash cards, read the chapter, etc.
8. It is often helpful to have study partners to assist you in understanding the material. I STRONGLY RECOMMEND STUDY GROUPS.

9. Cheating is totally unethical and will not be tolerated in this class. First offense is an F for that assignment or exam. The second offense will net you an F for the course.

ADA Policy: In accordance with the Americans with Disabilities Act (ADA), please inform the instructor of any special learning needs you may have at the beginning of the semester so that reasonable accommodations may be provided. Please present documentation of the same to the instructor.

Weekly Schedules:

DATE	LEC	TOPIC
Jan 9	1 & 2	Chapter 12 – Gluconeogenesis – precursors, reactions and regulation
Jan 11	3	Pentose Phosphate Pathway - Reactions
Jan 16		NO CLASS – Martin Luther King Holiday
Jan 18	4 & 5	Glycogen Synthesis, Degradation and Hormone Regulation
Jan 23	6	Chapter 15 – Chloroplast, Chlorophyll and Photosynthesis
Jan 25	7 & 8	Bacterial Photosystems I and II and the Z-scheme and how they compare to plant photosystems
Jan 30	9 & 10	Dark Reactions, the Calvin Cycle and Sucrose & Starch Synthesis
Feb 1		EXAM 1 – Chapters 12 and 15
Feb 6	11	Chapter 9 – Structure of lipids
Feb 8	12 & 13	Structure of membranes, roles of proteins and signal transduction
Feb 13	14	CHAPTER 16 – INTRODUCTION TO THE DIETARY LIPIDS, THEIR ABSORPTION AND MOBILIZATION
Feb 15	15 & 16	Synthesis of Fatty Acids, fatty acid extension and desaturation reactions
Feb 20	17 & 18	Synthesis of Triacylglycerols, Glycerophospholipids, Eicosanoids, Ether Lipids, Sphingolipids and Cholesterol
Feb 22	19	The Three Steps of Beta Oxidation of Even Number Fatty Acids,
Feb 27	20 & 21	Oxidation of Odd Number and Unsaturated Fatty Acids The Synthesis and Oxidation of Ketone bodies The Regulation of both the Synthesis and Oxidation of Fatty Acids
Feb 29		EXAM 2 – Chapters 9 and 16
Mar 5		NO CLASS – Spring Break
Mar 7		NO CLASS – Spring Break
Mar 12	22	CHAPTER 17 – NITROGEN CYCLE, NITROGEN FIXATION AND ASSIMILATION OF AMMONIA TO FORM GLUTAMATE OR GLUTAMINE,
Mar 14	23 & 24	Transamination Rxns and the Synthesis of the Amino Acid Families
Mar 19	25	Synthesis of the Amino Acid Families
Mar 21	26	Protein Turnover / Urea cycle / Glucose-Alanine Cycle
Mar 26	27 & 28	Catabolism of the Carbon Chains of the

		Amino Acids / Replenishment of bicarbonate
Mar 28		EXAM 3 – CHAPTER 17
Apr 2	29	CHAPTER 18 – SYNTHESIS AND REGULATION OF PURINES THROUGH IMP
Apr 4	30 & 31	Synthesis and Regulation of Pyrimidines / Reduction of Ribonucleotides
Apr 9		NO SCHOOL
Apr 11	32	Synthesis of dTMP / Salvage of Purines/Pyrimidines
Apr 16	33	Purine and Pyrimidine Catabolism
Apr 18	34 & 35	Neurotransmission
Apr 23	36	Neurotransmission
Apr 25		EXAM 4 – CHAPTER 18 AND NEUROTRANSMISSION

Advising & Tutorial Support:	
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