

Syllabus for
CHE 459—Biochemistry Lecture
3.0 Credit Hours
Fall 2016

I. COURSE DESCRIPTION

An introductory study of biochemistry with emphasis on intermediate metabolism. Topics include protein structure and function, enzyme kinetics, the major metabolic pathways, and integration of metabolism. (Highly recommended for all those planning to take the MCAT, PCAT or DCAT.)

Prerequisites: CHE 212 Lecture and Lab

II. COURSE GOALS

The purpose of this course is to provide students with the necessary principles and concepts to understand many of the major biochemical processes within living cells from a chemical perspective. Students will learn material which is a foundation for further study in biochemistry encountered in medical and graduate school.

III. STUDENT LEARNING OUTCOMES FOR THIS COURSE

Terminal Objectives

As a result of successfully completing this course, the student will be able to do the following:

- A. Write structures of bio-molecules and relate their structure to their function.
- B. Discuss protein structure and the role of structure in enzyme function.
- C. Describe enzymes in terms of catalytic properties and how they themselves are regulated and how they regulate cellular functions.
- D. Write metabolic pathways for carbohydrates, lipids, and certain amino acids.
- E. Correlate metabolic pathways with cellular structures.
- F. Describe the effect on metabolism of specific physiological conditions. Discuss metabolic energy production and its control and utilization. Describe how biochemistry applies to health and fitness.

IV. TEXTBOOKS AND OTHER LEARNING RESOURCES

- A. Required Textbooks (choose one; notice that a student study guide is available from Wiley and is recommended but not required)
Donald Voet, Judith Voet, and Charlotte Pratt, Fundamentals of Biochemistry: Life at the Molecular Level, Wiley, 5th edition, 2016. ISBN: 978-1-118-91846-3 (e-Text).
Donald Voet, Judith Voet, and Charlotte Pratt, Fundamentals of Biochemistry: Life at the Molecular Level, Wiley, 5th edition, 2016. ISBN: 978-1-118-91840-1 (Hardcover).

- B. Recommended Textbooks
Donald Voet and Judith Voet, Student Companion to Accompany Fundamentals of Biochemistry, Wiley, 5th edition, ISBN: 978-1-119-26793-5.

V. POLICIES AND PROCEDURES

- A. University Policies and Procedures
1. Attendance at each class or laboratory is mandatory at Oral Roberts University. Excessive absences can reduce a student's grade or deny credit for the course.
 2. Students taking a late exam because of an unauthorized absence are charged a late exam fee.
 3. Students and faculty at Oral Roberts University must adhere to all laws addressing the ethical use of others' materials, whether it is in the form of print, electronic, video, multimedia, or computer software. Plagiarism and other forms of cheating involve both lying and stealing and are violations of ORU's Honor Code: "I will not cheat or plagiarize; I will do my own academic work and will not inappropriately collaborate with other students on assignments." Plagiarism is usually defined as copying someone else's ideas, words, or sentence structure and submitting them as one's own. Other forms of academic dishonesty include (but are not limited to) the following:
 - a. Submitting another's work as one's own or colluding with someone else and submitting that work as though it were his or hers;
 - b. Failing to meet group assignment or project requirements while claiming to have done so;
 - c. Failing to cite sources used in a paper;
 - d. Creating results for experiments, observations, interviews, or projects that were not done;
 - e. Receiving or giving unauthorized help on assignments.By submitting an assignment in any form, the student gives permission for the assignment to be checked for plagiarism, either by submitting the work for electronic verification or by other means. Penalties for any of the above infractions may result in disciplinary action including failing the assignment or failing the course or expulsion from the University, as determined by department and University guidelines.
 4. Final exams cannot be given before their scheduled times. Students need to check the final exam schedule before planning return flights or other events at the end of the semester.
 5. Students are to be in compliance with University, school, and departmental policies regarding the Whole Person Assessment requirements. Students should consult the Whole Person Assessment handbooks for requirements regarding general education and the students' majors.
 - a. The penalty for not submitting electronically or for incorrectly submitting an artifact is a zero for that assignment.
 - b. By submitting an assignment, the student gives permission for the assignment to be assessed electronically.
- B. School and /or Department Policies and Procedure
1. The Department of Biology and Chemistry adheres to the Assessment policy concerning plagiarism as described in the University Catalog, "Written assignments using sources must demonstrate ethical and accurate use of source

material. Plagiarism and any unethical or inappropriate use of sources are not tolerated.”

2. The following assessment actions will be taken in the event of documented instances of plagiarism on written assignments, copying of homework assignments, or cheating during examinations:
 - a. An automatic zero will be given for the assignment or exam.
 - b. The original assignment or exam will be kept in the student file and a copy will be given to the student. This could have a negative impact on letters of reference and admission to graduate schools and other postgraduate programs.
 - c. The Department will take repeated offences as grounds for further action.
3. Any Whole Person Assessment activity required in this course must be completed and assessed prior to the end of the semester to receive course credit; otherwise a grade of incomplete will be assigned.

B. Course Policies and Procedures

1. Evaluation Procedures

Three Hourly-Exams	60%
Homework/Quizzes	10
Case Study	10
Final	<u>20</u>
Total	100%

Letter grades will be based on:

A= 90-100, B=80-89, C=70-79, D=60-69, and F below 60. However, the instructor reserves the right to curve this scale.

2. Whole Person Assessment requirements.
None.
3. Other Policies and/or Procedures
Role will be taken at the beginning of each class session. The missing of 8 class sessions will result in a grade reduction of one letter grade. Missing 10 class sessions will result in a grade reduction of 2 letter grades, and the missing of 14 class sessions will automatically result in a grade of F. The absences allowed prior to a grade reduction are designed to allow for emergencies and illnesses and are not designed for indiscriminate use. Administrative excuses are granted only when a student is on official University business and has received approval in advance from the University administration.

VI. COURSE CALENDAR

Week	Topics of Discussion and Study
1	Introduction to biochemistry, bio-molecules and the importance of water.
2	Amino acids, peptides and proteins
3	Structure and function of proteins
4	Enzymes
5	Bioenergetics
6	Carbohydrates
7	Glycolysis
8	The citric acid cycle
9	Oxidative phosphorylation and the electron transport chain
10	Lipids
11	Beta oxidation
12	Lipid biosynthesis
13	Urea cycle and amino acid metabolism
14	Integration of metabolism
15	Special topics

Course Inventory for ORU's Student Learning Outcomes

Biochemistry Lecture – CHE 459 Fall 2016

This course contributes to the ORU student learning outcomes as indicated below:

Significant Contribution – Addresses the outcome directly and includes targeted assessment.

Moderate Contribution – Addresses the outcome directly or indirectly and includes some assessment.

Minimal Contribution – Addresses the outcome indirectly and includes little or no assessment.

No Contribution – Does not address the outcome.

The Student Learning Glossary at <http://ir.oru.edu/doc/glossary.pdf> defines each outcome and each of the proficiencies/capacities.

OUTCOMES & Proficiencies/Capacities		Significant Contribution	Moderate Contribution	Minimal Contribution	No Contribution
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1	Outcome #1 – Spiritually Alive Proficiencies/Capacities				
1A	Biblical knowledge			X	
1B	Sensitivity to the Holy Spirit			X	
1C	Evangelistic capability			X	
1D	Ethical behavior		X		

2	Outcome #2 – Intellectually Alert Proficiencies/Capacities				
2A	Critical thinking	X			
2B	Information literacy		X		
2C	Global & historical perspectives			X	
2D	Aesthetic appreciation		X		
2E	Intellectual creativity		X		

3	Outcome #3 – Physically Disciplined Proficiencies/Capacities				
3A	Healthy lifestyle		X		
3B	Physically disciplined lifestyle			X	

4	Outcome #4 – Socially Adept Proficiencies/Capacities				
4A	Communication skills		X		
4B	Interpersonal skills			X	
4C	Appreciation of cultural & linguistic differences			X	
4D	Responsible citizenship			X	
4E	Leadership capacity		X		