Syllabus for
BIO 411—Molecular Cell Biology Lecture
3.0 Credit Hours
Fall 2016

I. COURSE DESCRIPTION

An introductory survey of biological processes of prokaryotic and eukaryotic cells with special emphasis on the structure and function relationships, current biochemical theory and techniques, and the molecular basis of genetics and heredity.
Prerequisites: CHE 111 and CHE 112 lectures and labs; BIO 111 and BIO 112 lectures and labs; BIO 209.
Corequisite: BIO 411 Lab

II. COURSE GOALS

Molecular cell biology is one of the core curriculum courses designed to give the biology or chemistry major a broad background in the field of biology. One major goal of the course is to enable the student to integrate several sub disciplines of biology and chemistry into a meaningful whole (biochemistry, organic chemistry, genetics, physiology, and molecular biology). A second major goal is to provide biology and chemistry majors with a solid undergraduate foundation in molecular cellular biology—a solid foundation upon which to build his or her career in biological health-related fields.

III. STUDENT LEARNING OUTCOMES FOR THIS COURSE

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

1. Identify the ultra structure of a "typical" animal cell and its organelles.
2. Correlate the structures of cell organelles to their function.
3. Describe, using chemical structures, the respiratory processes of the cell, including all intermediate compounds, enzymes, the electron transport system, and energy produced at each stage of metabolism.
4. Discuss and illustrate the structure, function, and location of the different species of DNA and RNA in the cell.
5. Discuss the structure, kinds, functions and syntheses of proteins, carbohydrates and fats.
6. Describe and distinguish between the cell division processes of mitosis and meiosis in plant and animal cells.
7. List, describe, and give applications for specific molecular biology techniques.
8. Explain the events associated with carcinogenesis at the molecular level.

IV. TEXTBOOK AND OTHER LEARNING RESOURCES

Required Books:
Bruce Alberts, Dennis Bray, Karen Hopkin, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, Peter Walter 4th Edition 2014. Essential Cell Biology. Garland Science: New York. ISBN: 978-0-8153-4454-4.

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 Course Policies and Procedures

1. Evaluation Procedures
   a. Grading:

Exams	4 x 100 points	= 400
Written/Oral Assignments	50 points	= 50
Final Exam	1 x 200 points	= 200
TOTAL		= 650

b. Grades will be assigned as follows:

90 -100%	=	A
80 – 89.99%	=	B
70 – 79.99%	=	C
60 – 69.99%	=	D
59.99% and below	=	F

2. The student may be excused for scheduled department events and/or university academic events. All requests must be submitted in writing and have either a chairman's or dean's signature.
3. The student is allowed three absences for illness, emergencies, or for personal reasons. Thereafter, each absence will result in a 2% reduction in the total semester points. Students who are absent are responsible for finding out what they missed and arranging to makeup any possible outstanding work. **All work must be made up within a week.**
4. Only administrative excuses or serious medical problems are allowed for an excused late exam. In such cases, the instructor must be contacted BEFORE the scheduled exam time. If the instructor is not contacted upon a student's return to class after a missed exam to schedule a makeup exam, the makeup is treated as an unexcused late exam. Unexcused late exams may be taken, but will cost the student a late exam fee and 20% of his or her potential maximum makeup exam grade the first time, 30% the second time, 40% the third time, etc. All makeup exams must be taken with a week.
5. All assignments require individualized effort unless indicated otherwise. Any evidence of plagiarism or cheating on assignments will result in a zero for that assignment. Any cheating on a quiz or exam or a repeat plagiarism offence on an assignment will result in an automatically earned "F" for the semester.
6. Whole Person Assessment Requirements
   None

VI. COURSE CALENDAR

Week	Topic	Assignment
1	The Fundamental Units of Life	Chapter 1
	Chemical Components of Cells	Chapter 2
2	Chemical Components of Cells	Chapter 2
	Energy, Catalysis, and Biosynthesis	Chapter 3
3	Protein Structure and Function	Chapter 4
4	DNA and Chromosomes	Chapter 5
	EXAM 1 (Chs 1-5)	
5	DNA Replication, Repair, and Recombination	Chapter 6
	From DNA to Protein: How Cells Read the Genome	Chapter 7

Week	Topic	Assignment
6	From DNA to Protein: How Cells Read the Genome	Chapter 7
	Control of Gene Expression	Chapter 8
7	How Genes and Genomes Evolve	Chapter 9
	Modern Recombinant DNA Technology	Chapter 10
8	Modern Recombinant DNA Technology	Chapter 10
	Membrane Structure	Chapter 11
	EXAM 2 (Chs 6-10)	
9	Membrane Structure	Chapter 11
	Transport Across Cell Membranes	Chapter 12
10	How Cells Obtain Energy From Food	Chapter 13
	Energy Generation in Mitochondria and Chloroplasts	Chapter 14
11	Energy Generation in Mitochondria and Chloroplasts	Chapter 14
	Intracellular Compartments and Protein Transport	Chapter 15
12	EXAM 3 (Chs 11-15)	
	Cell Signaling	Chapter 16
13	Cytoskeleton	Chapter 17
	The Cell-Division Cycle	Chapter 18
14	The Cell-Division Cycle	Chapter 18
15	Cell Communities: Tissues, Stem Cells, and Cancer	Chapter 20
	EXAM 4 (Chs 16-20)	

Course Inventory for ORU's Student Learning Outcomes

Molecular Cell Biology Lecture – BIO 411
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
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	