Syllabus for
BIO 311—Medical Genetics Lecture
3.0 Credit Hours
Spring 2021

I. COURSE DESCRIPTION

An introduction to the principles of genetics including Mendelian inheritance, medical genetics, and genomics with an emphasis at the molecular level.
Prerequisite: One year of biology and BIO 370 required; statistics recommended.
Corequisite: BIO 311 Lab

II. COURSE GOALS

A. As one of the core curriculum courses, the purpose of this course is to provide students with an understanding of classic Mendelian and population genetics as well as current molecular developments and techniques.

B. Genetics enables the student to integrate several subdisciplines of biology and chemistry into a meaningful whole (organic chemistry, biochemistry, statistics, and cell and molecular biology).

C. Genetics provides science majors with a solid genetic foundation from which to build a career in science and related fields and to evaluate genetic issues.

III. STUDENT LEARNING OUTCOMES FOR THIS COURSE

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

A. Demonstrate and explain basic hereditary concepts.

B. Use these concepts to predict hereditary outcomes as they apply to Mendelian conditions.

C. Describe the genetic regulation of cell processes, including mitosis, transcription, and translation, as well as, relate regulation errors to genetic mutations and disease.

D. Discuss the genetic influence on individuals, populations, and species and its role in biological evolution.

E. Explain current molecular techniques such as gel electrophoresis, PCR, Western Blots, gene cloning, gene expression systems, RNA interference, and Northern Blots.

F. Discuss current ethical issues in genetics such as cloning, stem cell research, and genetic engineering.

IV. TEXTBOOKS AND OTHER LEARNING RESOURCES

Required Textbooks:
Klug, W. et al. Concepts of Genetics, 12th Ed. Pearson. 2019. ISBN: 9780134604718

V. POLICIES AND PROCEDURES

A. University Policies and Procedures

1. 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.
2. 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.
3. 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

Item		Points Possible
Exams	3 x 100 points	300
Quizzes	20 x 10 points	200
Critiques, Case studies, Special Topics.		100
Final Exam		200
TOTAL		800

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 miss more than 9 class periods will automatically earn an "F" for the semester.
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 within a week. 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.**
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.

I. COURSE CALENDAR

WEEK	TOPIC	ASSIGNMENT
1	Introduction to Genetics	Chapter 1
	Mitosis and Meiosis	Chapter 2
	Mendelian Genetics	Chapter 3
2	Mendelian Genetics	Chapter 3
	Extensions of Mendelian Genetics	Chapter 4
3	Chromosome Mutations	Chapter 8
4	Extranuclear Inheritance	Chapter 9
	EXAM 1	
5	DNA Structure and Analysis	Chapter 10
	DNA Replication and Recombination	Chapter 11
6	DNA Replication and Recombination	Chapter 11
	DNA Organization in Chromosomes	Chapter 12
7	The Genetics Code and Transcription	Chapter 13
	Translation and Proteins	Chapter 14
8	Translation and Proteins	Chapter 14
	EXAM 2	
	Gene Mutation, DNA Repair, Transposition	Chapter 15
9	Regulation of Gene expression in Bacteria	Chapter 16
	Regulation of Gene expression in Bacteria	Chapter 16
10	Transcription Regulation in Eukaryotes	Chapter 17
	Post-transcription Regulation in Eukaryotes	Chapter 18
11	Epigenetic Regulation of Gene Expression	Chapter 19
	EXAM 3	
12	Developmental Genetics	Chapter 23
	Developmental Genetics	Chapter 23
13	Cancer Genetics	Chapter 24
	Cancer Genetics	Chapter 24
14	Population and Evolutionary Genetics	Chapter 26
15	Final Exam	

Course Inventory for ORU's Student Learning Outcomes

Medical Genetics Lecture – BIO 311
Spring 2021

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 literacy				X
1B Spiritual Formation				X
2 **Outcome #2 – Intellectually Alert** Proficiencies/Capacities				
2A Critical thinking, creativity, and aesthetics	X			
2B Global & historical perspectives		X		
2C Information literacy	X			
2D Knowledge of the physical and natural world	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 Ethical reasoning and behavior			X	
4B Intercultural knowledge and engagement				X
4C Written and Oral Communication			X	
4D Leadership capacity				X

(Revised 8/1/17)