

**Spring 2018**

**ALICE LLOYD COLLEGE**

**Biol 305**

**Genetics**

**COURSE OUTLINE:**

**Course Number and Title: Biol 305 Genetics**

**Instructor:** Robert G. Hamilton, Ph.D.

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Office Hours: posted at office door

Lecture: MWF 10:00 – 10:50. ASC 404

Lab 1 F 8:00 – 8:50 ASC 214

Lab 2 W 2:00 – 3:50 ASC 214

**Prerequisite(s):** Biol 205, 206, 220 or permission of instructor. Mat 250 recommended.

**Course Description:**

**BIOL 305 Genetics. 4 credit hours**

An introduction to basic principles of heredity and variation in plants and animals, including classical, molecular, biochemical and population genetics. The physical and chemical basis of heredity are stressed and applications of genetics to problems of medicine, agriculture and evolution are examined. Three lecture hours and two laboratory hours.

**Objectives of the Course:**

To familiarize the student with the science of Genetics. Students will learn how our knowledge of genetics has evolved and is applied in modern science.

The information presented during this course will be focused on specific problems. Students will be required to synthesize information into written and oral responses to key problems presented during the course as a means of developing abilities to effectively integrate and communicate information regarding science related topics.

### **Requirements for the Course:**

Students will be required to:

1. attend scheduled class lectures, take all exams and quizzes, and complete all written assignments.
2. read regularly the assigned text material and associated supplementary readings.
3. demonstrate an understanding of the science of genetics.
4. demonstrate the ability to integrate knowledge into an understanding of genetics.
5. participate in group tasks, oral discussions, and individual efforts as apply to the responsive questions and critical-thinking tasks.

### **Technology:**

Students will be encouraged to access on-line resources and websites that supplement their class lecture and laboratory readings. Students will use technologies like PCR and use online sources for the analysis of data.

### **Writing Across the Curriculum:**

This course will employ opportunities for students to display their verbal and written skills. Several essay questions will appear on exams, and other work, especially problem sets, where the student's grammar, spelling and critical thinking will be evaluated.

### **Resources and Materials:**

#### **Textbook:**

Griffiths, Wessler, Carroll and Doebley. 2015. Introduction to Genetic Analysis, 11th edition. Freeman. ISBN-13: 978-1464109485.

#### **Attendance Policy:**

**Attendance is required for all scheduled lectures as well as the laboratory sections. *Prompt arrival to class is expected.*** As per ALC policy, any student with an absentee rate  $\geq 20\%$ , *regardless of whether the absences are excused or unexcused*, will fail the course. It is the

*student's responsibility* to make every attempt to contact the instructor in advance to notify her of officially excused absences (e.g., professional school interviews, participation in college sanctioned events, etc.) in order to make alternative arrangements to complete any work that would be due during the excused absence. It is the *student's responsibility* to contact the instructor as soon as possible following any unforeseeable emergency (e.g., illness, accident, family emergency, etc.) in order to be given any extensions on deadlines for completion of any missed assignments. It is the *student's responsibility* to clear any absences with the Office of the Academic Dean. It is the *student's responsibility* to complete any and all assignments and to turn them in to be graded in a timely manner.

### **Critical Thinking:**

Alice Lloyd College has a goal to improve the critical thinking abilities of its students. The College has adopted Paul and Elder's (2007) definition of critical thinking, which defines critical thinking as, "the art of analyzing and evaluating thinking with a view to improving it" (p. 4).

Source: Paul, R., & Elder, L. (2007). *The Miniature Guide to Critical Thinking Concepts and Tools* (4<sup>th</sup> ed.). Tomales, CA: Foundation for Critical Thinking Press.

This course involves a large number of analytical problem solving. These are problems that have one right answer and an infinite number of wrong answers. Students will need to learn to apply principles learned in class to solve the problems. This will involve critical thinking.

The presentation will be evaluated as a critical thinking assignment.

### **Dress Code:**

Alice Lloyd College has a long-standing tradition of emphasizing development of the total person and a commitment to personal and community enhancement. As members of the campus community, students are expected to dress modestly and appropriately for various occasions.

The College recognizes that "modest" or "appropriate" is often loosely defined in society at large. Therefore, the following guidelines are offered to assist students in choosing suitable dress:

**Professional Day (Tuesday) Dress:** Professional dress will be required of all students on central campus until 2:00 p.m. and for all convocation programs. Central campus includes all of the campus buildings with the exception of the gym, maintenance building, fitness center, and the residence halls.

Note: Professional Dress is defined as attire appropriate for professional business presentation or job interviews.

**Professional Dress for Men (all items listed together must coordinate) consists of:**

- Business suit, dress shirt (tucked in), tie, belt, dress socks and coordinating dress shoes or boots.
- Sport coat, dress slacks, dress shirt (button-down long/short sleeve, tucked in), belt, tie, dress socks and coordinating dress shoes or boots.

**Men's Shoes:**

- Polished lace-up or slip on shoes,
- Polished dress boots

**Professional Dress for Women (all items listed together must coordinate) consists of:**

- Business pants suit (Coordinating jacket/pants), blouse, hosiery/matching trouser socks, and appropriate dress shoes.
- Business skirt suit (Coordinating jacket/skirt), blouse, nylons, and appropriate dress shoes.
- Business dress with sleeves or coordinating jacket, nylons, and appropriate dress shoes.

**Women's Shoes:**

- Dress shoes with heel no higher than 2"
- Professional open-toed with/without a back strap with heels no higher than 2"
- Knee-length dress boots with heel no higher than 2"

**Make-up and late policies:**

Tests can be made up if the student notifies the instructor in advance and a make up date arranged prior to the date of the test. It is important to return tests as quickly as possible, and so delays due to make up will be reduced as much as possible.

You cannot miss your presentations. We will negotiate presentation times well in advance, and subsequent conflicts must be resolved prior to the presentation date in any event.

**Policy on Plagiarism:**

The ALC faculty has officially adopted the following policy on plagiarism:

**"Plagiarism is the act of using another's idea or expression in your writing without acknowledging the source...In short, to plagiarize is to give the impression that you have written or thought something that you have in fact borrowed from someone else" (21)**

**"Plagiarism often carries severe penalties, ranging from failure in a course to expulsion from the school."**

**"The most blatant form of plagiarism is to repeat as your own someone else's sentences, more or less verbatim..." (22)**

**“Other forms of plagiarism include repeating someone’s particularly apt phrase without appropriate acknowledgement, paraphrasing another person’s argument as your own, and presenting another’s line of thinking as though it were your own...”(23)**

**Source: Gibaldi, Joseph. *MLA Handbook for Writers of Research Papers*. 3rd ed. New York: Modern Language Association of America, 1988.**

**Evaluation:**

**Midterm exams:**

There will be 3 midterm exams during the semester. 30% of your grade will be attributed to midterm exams. Each exam is thus worth 10% of your final grade.

**Laboratory:**

Labs will focus on genetic analysis. We will look at several types of genetic analysis throughout the semester. There will be three assignments each worth 5% of the final grade each and one lab report worth 10% of final grade. One lab exam, worth 10% of the final grade, will be given. Lab presentation will be worth 10% of the final grade. Lab is worth 40% of your final grade.

**Final Exam:**

Worth **20% of the final grade**.

**Grading:**

**Lecture:**

Midterm exams (collectively) **30% of total grade**

**Laboratory:**

Assignments: **15% of total grade**

Lab Report **10% of total grade**

Lab exam **15% of total grade**

Lab Presentation **10% of total grade**

**The following scale will be used for assigning grades:**

A = 90-100%

B = 80-89%

C = 70-79%

D = 50-69%

F =  $\leq$  49%

**Lecture Schedule (tentative):**

**Midterm #1. Chapters 1 – 4.**

**Midterm #2. Chapters 5- 8.**

**Midterm #3. Chapters 9-12.**

**Laboratory Schedule:**

**Lab 1 Fruit Fly set up. From the initial setup the fruit fly experiment will require work every other lab.**

**Lab 2. Harvest of Fear Video. Assignment #1. This video will occupy two lab periods**

**Lab 3. Probability and Statistics. Assignment. #2**

**Lab 4. Population Genetics .**

**Lab 5. Quantitative Inheritance**

**Lab 6. Hypothesis Testing**

**Lab 7. Hypertrophy. Assignment #3**

**Lab 8. Fruit Fly Assignment. Lab Report**

**Lab 9. Lab Exam**

**Lab 10. Presentations. Will take 2 lab periods to complete.**

**Lab Presentation:** Students will each make a 10 minute presentation of a genetic disease. I will be looking for a discussion of what mutants cause the disease, how the disease affects the cell and how those effects lead to the phenotype we describe as the disease.