



## BIOL 254: \*Genetics

<b>Location:</b>	Evening
<b>Address:</b>	1001 Rogers Street Columbia, MO 65216
<b>Section:</b>	19FALL2/BIOL/254/AEV
<b>Semester Credit Hours:</b>	3
<b>Class Day(s) and Time(s):</b>	Tuesday, Thursday 5:30 PM - 7:30 PM from October 21, 2019 to December 14, 2019

 Syllabus Contents

- [Course Information](#)
- [Textbooks](#)
- [Technology Requirements](#)
- [Course Learning Outcomes](#)
- [Grading](#)
- [Schedule of Due Dates](#)
- [Assignment Overview](#)
- [Course Outline](#)
- [Additional Resources](#)
- [Columbia College Policies & Procedures](#)

 Course Information

## Catalog Description

Basic principles of Mendelian and molecular genetics. Cross-listed with ENVS 254. Concurrent enrollment in BIOL 254L is required.

**Prerequisites:** Grade of C or better in BIOL 112; Chem 109 or Chem 110 with a grade of C or better.

## Additional Notes

The topics and due dates may be adjusted based on class needs. The order of the topics covered may change based upon current events, course pace, and student interest.

 Textbooks

As part of Truition<sup>SM</sup>, students will receive their course materials automatically as described below.

 Brooker. (2018). *Genetics Analysis & Principles* (6th). McGraw-Hill. eText

## Bookstore Information

Visit <https://www.ccis.edu/bookstore.aspx> for details.

## eText Information

If a course uses an eText, (see textbook information above) the book will be available directly in Desire2Learn (D2L) seven days before the session begins, if registered for courses prior to that date. Upon first login to VitalSource, students should

use their CougarMail email address; alternate email addresses cannot be used. More information about how to use the VitalSource platform, including offline access to eTexts, can be found in D2L.

#### Physical Course Materials Information

Students enrolled in courses that require physical materials will receive these materials automatically at the shipping address on file with Columbia College. Delivery date of physical materials is dependent on registration date and shipping location. Please refer to confirmation emails sent from Columbia College for more details on shipping status.

**Returns:** Students who drop a class are responsible for returning any physical course materials that were shipped. To initiate a return, visit [Ingram Returns](#) to generate a pre-paid return label. Materials from dropped courses must be returned within 30-days of receipt. **Failure to return physical items from a dropped course will result in a charge to the student account for all unreturned items.**

**Note:** Students who opt-out of having their books provided as part of [Tuition<sup>SM</sup>](#) are responsible for purchasing their own course materials.

#### Technology Requirements

##### **THIS IS A TECHNOLOGY-ENRICHED COURSE WHICH COMBINES IN-SEAT INSTRUCTION WITH ONLINE LEARNING.**

Participation in this course will require the basic technology for all classes at Columbia College:

- A computer with reliable internet access
- A web browser
- Acrobat Reader
- Microsoft Office or another word processor such as Open Office

For more information, see [technical requirements](#).

#### Course Learning Outcomes

1. Examine the fundamental principles that underlie classical and molecular genetics.
2. Understand and relate the structure of genes in prokaryotes and eukaryotes to gene expression and protein synthesis.
3. Investigate mechanisms of gene expression and regulation.
4. Examine the impact of genetic variation on evolution of populations and species.
5. Understand the basic principles of genetic engineering and potential uses and impacts of its application.

#### Grading

##### Grading Scale

Grade	Points	Percent
A	900 - 1000	90-100%
B	800 - 899	80-89%
C	700 - 799	70-79%
D	600 - 699	60-69%
F	0 - 599	0-59%

##### Grade Weights

Assignment Category	Points	Percent
Homework	210	21%
In-Class Activities	240	24%
Examinations	500	50%
Project	50	5%
<b>Total</b>	<b>1000</b>	<b>100%</b>

 Schedule of Due Dates

Week 1

Assignment	Points	Due
Syllabus	15	Thursday
Introduction to Genetics	--	Tuesday
DNA & Chromosome Structures	--	Thursday
Warm Up #1	10	Thursday
DNA Building Activity	15	Thursday
Practice Problem Set #1	15	Thursday

Week 2

Assignment	Points	Due
Protein Structure, Transcription, & Translation	--	Tuesday
Warm Up #2	10	Tuesday
Central Dogma Activity	15	Tuesday
Practice Problem Set #2	15	Tuesday
DNA Replication	--	Thursday
Warm Up #3	10	Thursday
DNA Replication Activity	15	Thursday
Practice Problem Set #3	15	Thursday

Week 3

Assignment	Points	Due
Lecture Exam 1	125	Tuesday
Cell Cycle and Mitosis	--	Tuesday
Meiosis & Mendelian Inheritance	--	Thursday
Warm Up #4	10	Thursday
Meiosis Building Activity	15	Thursday
Practice Problem Set #4	15	Thursday
Practice Problem Set #5	15	Thursday

Week 4

Assignment	Points	Due
Sex-linkage Inheritance	--	Tuesday
Warm Up #5	10	Tuesday
Sex-linkage Activity	15	Tuesday
Practice Problem Set #6	15	Tuesday
Lecture Exam 2	125	Thursday
Co-dominance, incomplete dominance, & epistasis	--	Thursday
Practice Problem Set #7	15	Thursday

Week 5

Assignment	Points	Due
Polygenic inheritance & quantitative traits	--	Tuesday
Warm Up #6	10	Tuesday
ABO Bloody Typing Activity	15	Tuesday
Practice Problem Set #8	15	Tuesday
Gene linkage, genetic mapping, & homologous recombination	--	Thursday
Warm Up #7	10	Thursday

Assignment	Points	Due
Practice Problem Set #9	15	Thursday
<b>Week 6</b>		
Assignment	Points	Due
Genetic Disease Projects	50	Tuesday
CRISPR-Cas-9 Activity	15	Thursday
<b>Week 7</b>		
Assignment	Points	Due
Practice Problem Set #11	15	Thursday
Lecture Exam 3	125	Tuesday
Genetic Engineering & Biotechnology	--	Tuesday
Practice Problem Set #10	15	Tuesday
Mutation, Repair, Cancer, & Transposons	--	Thursday
Warm Up #8	10	Thursday
Cancer Activity	15	Thursday
<b>Week 8</b>		
Assignment	Points	Due
Gene regulation, Population Genetics, & Molecular Evolution	--	Tuesday
Warm Up Activity #9	10	Tuesday
Lac Activity	15	Tuesday
Practice Problem Set #12	15	Tuesday
Practice Problem Set #13	15	Tuesday
Lecture Exam 4	125	Thursday
<b>Total Points: 1000</b>		

## Assignment Overview

### Assignments

In-Class Activities will include warm-ups and interactive hands-on activities or discussions.

Homework will include Practice Problem Sets for each content area.

The project will be completed with a partner to explore a genetic disease.

### Examinations

Four unit exams will include short-answer, concept-based questions for students to explain their understanding of ideas. 25 points of each exam will include a pre-written, typed essay based on a concept prompt.

## Course Outline

Click on each week to view details about the activities scheduled for that week.

### Week 1:

#### Syllabus

Sign the Syllabus Acknowledgement Statement

## **Introduction to Genetics**

Read Chapter 1

## **DNA & Chromosome Structures**

Read Chapters 8, 9, & 10.

### **Warm Up #1**

### **DNA Building Activity**

### **Practice Problem Set #1**

Note: Submit for grading on the day when Lecture Exam 1 is taken.

## **Week 2:**

### **Protein Structure, Transcription, & Translation**

Read Chapters 12, 13, & 24

### **Warm Up #2**

### **Central Dogma Activity**

### **Practice Problem Set #2**

Note: Submit for grading on the day when Lecture Exam 1 is taken.

### **DNA Replication**

Read Chapter 11

### **Warm Up #3**

### **DNA Replication Activity**

### **Practice Problem Set #3**

Note: Submit for grading on the day when Lecture Exam 1 is taken.

## **Week 3:**

### **Lecture Exam 1**

Lecture Exam 1 covering Unit 1: Introduction, DNA & Chromosome Structures, Protein Structure, Transcription, & Translation, and DNA Replication.

### **Cell Cycle and Mitosis**

Read Chapter 3

### **Meiosis & Mendelian Inheritance**

Read Chapters 2 & 3

### **Warm Up #4**

### **Meiosis Building Activity**

### **Practice Problem Set #4**

Note: Submit for grading on the day when Lecture Exam 2 is taken.

### **Practice Problem Set #5**

Note: Submit for grading on the day when Lecture Exam 2 is taken.

## **Week 4:**

### **Sex-linkage Inheritance**

Chapter 4

### **Warm Up #5**

### **Sex-linkage Activity**

### **Practice Problem Set #6**

Note: Submit for grading on the day when Lecture Exam 2 is taken.

### **Lecture Exam 2**

Lecture Exam 2 covers material from Unit 2: Cell Cycle & Mitosis, Meiosis & Mendelian Inheritance, and Sex-linkage inheritance.

### **Co-dominance, incomplete dominance, & epistasis**

Read Chapters 4, 5, & 16

### **Practice Problem Set #7**

Note: Submit for grading on the day when Lecture Exam 3 is taken.

## **Week 5:**

### **Polygenic inheritance & quantitative traits**

Read Chapter 28

### **Warm Up #6**

### **ABO Bloody Typing Activity**

### **Practice Problem Set #8**

Note: Submit for grading on the day when Lecture Exam 3 is taken.

### **Gene linkage, genetic mapping, & homologous recombination**

Read Chapters 6, 7, & 20

### **Warm Up #7**

### **Gene Mapping Activity**

### **Practice Problem Set #9**

Note: Submit for grading on the day when Lecture Exam 3 is taken.

## **Week 6:**

### **Genetic Disease Projects**

Note: Submit for grading on the day when Lecture Exam 3 is taken.

### **CRISPR-Cas-9 Activity**

Note: This activity will take place on the make-up class day for Thanksgiving Day.

## **Week 7:**

### **Practice Problem Set #11**

Note: Submit for grading on the day when Lecture Exam 4 is taken.

### **Lecture Exam 3**

Lecture Exam 3 will cover material from Unit 3: Co-dominance, incomplete dominance, & epistasis, polygenic inheritance & quantitative traits, and gene linkage, genetic mapping, & homologous recombination.

### **Genetic Engineering & Biotechnology**

Read Chapters 21, 22, & 23

### **Practice Problem Set #10**

Note: Submit for grading on the day when Lecture Exam 4 is taken.

### **Mutation, Repair, Cancer, & Transposons**

Read Chapters 19 & 25

### **Warm Up #8**

### **Cancer Activity**

## **Week 8:**

### **Gene regulation, Population Genetics, & Molecular Evolution**

Read chapters 14, 15, 27, & 29

### Warm Up Activity #9

### Lac Activity

### Practice Problem Set #12

Note: Submit for grading on the day when Lecture Exam 4 is taken.

### Practice Problem Set #13

Note: Submit for grading on the day when Lecture Exam 4 is taken.

### Lecture Exam 4

Lecture Exam 4 covers material from Unit 4: Genetic engineering & biotechnology, mutation, repair, cancer, transposons, and Gene regulation, Population Genetics, & molecular evolution

## + Additional Resources

Online databases are available at [library.ccis.edu](http://library.ccis.edu). You may access them using your CougarTrack login and password when prompted.

### Technical Support

If you have problems accessing the course or posting your assignments, contact your instructor, the Columbia College Technology Solutions Center, or the D2L Helpdesk for assistance. If you have technical problems with the VitalSource eText reader, please contact VitalSource. Contact information is also available within the online course environment.

- Columbia College Technology Solutions Center: [CCHelpDesk@ccis.edu](mailto:CCHelpDesk@ccis.edu), 800-231-2391 ex. 4357
- D2L Helpdesk: [helpdesk@d2l.com](mailto:helpdesk@d2l.com), 877-325-7778
- VitalSource: [support@vitalsource.com](mailto:support@vitalsource.com), 1-855-200-4146

### Online Tutoring

Smarthinking is a free online tutoring service available to all Columbia College students. Smarthinking provides real-time online tutoring and homework help for Math, English, and Writing. Smarthinking also provides access to live tutorials in writing and math, as well as a full range of study resources, including writing manuals, sample problems, and study skills manuals. You can access the service from wherever you have a connection to the Internet. I encourage you to take advantage of this free service provided by the college.

Access Smarthinking through CougarTrack at [Students -> Academics -> Resources](#).

## ! Columbia College Policies and Procedures

The policies set forth in the [Policy Library](#) are the current official versions of College policies and supersede and replace any other existing or conflicting policies covering the same subject matter. For more information on policies applicable to students, see [Student Policies](#). For more information on policies applicable to the entire Columbia College community, see [College-Wide Policies](#).

Students are expected to read and abide by the College policies. Policies of particular interest to students include, but not limited to the following:

- Graduate Grading Policy
- Undergraduate Grading Policy
- Registration Policy and Procedures
- Withdrawal Policy
- Alcohol and Other Drugs Policy
- Family Educational Rights and Privacy Act (FERPA)

### Additional Policies:

#### Academic Integrity and Plagiarism

Academic integrity is a cumulative process that begins with the first college learning opportunity. Students are responsible for

knowing and abiding by the [Academic Integrity Policy and Procedures](#) and may not use ignorance of either as an excuse for academic misconduct. Additionally, all required papers may be submitted for textual similarity review to Turnitin.com for the detection of plagiarism. All submitted papers may be included in the Turnitin.com reference database for the purpose of detecting plagiarism. This service is subject to the Terms and Conditions of Use posted on the Turnitin.com site.

## Disability Resources

If you have a disability that requires an accommodation, please speak with the instructor and consult the [Student Accessibility Resources](#) office. Student Accessibility Resources staff will determine appropriate accommodations and will work with your instructor to make sure these are available to you. To find additional information, see our [ADA and Section 504 Policy for Students](#).

## Notice of Non-Discrimination and Equal Opportunity:

The College has a process through which students, faculty, staff and community members who have experienced or witnessed incidents of discrimination, harassment, or retaliation on the basis of protected status, can report their experiences to a College official. For more information, see our [Non-Discrimination and Equal Opportunity Policy and Complaint Resolution Procedure](#).

## Title IX and Sexual Misconduct

The College is committed to addressing the issues of discrimination, harassment and sexual misconduct in the educational and workplace landscape and will continue to modify policies, procedures and prevention efforts as needed. For more information, see the College's [Title IX and Sexual Misconduct Policy](#).

## Course Policies and Procedures:

### Attendance Policy

Columbia College students are expected to attend all classes and laboratory periods for which they are enrolled.

For classes with an online component, attendance for a week includes submitting any assigned online activity. Assigned activities are scheduled prior to the course commencing. Assigned activity due dates are subject to change based on actual course progression and will be adjusted as necessary. Attendance for the week is based upon the date work is submitted. A class week is defined as the period of time between Monday and Sunday (except for week 8, when the work and the course will end at 11:59 PM Central Time on Saturday.) The course and system deadlines are based on the Central Time Zone.

Students are directly responsible to instructors for class attendance and work missed during an absence for any cause. If absences jeopardize progress in a course, the College reserves the right to drop or withdraw students from classes. For additional information, see the Administrative Withdrawal for Non-Attendance heading in the [Withdrawal Policy](#).

### CougarMail

All students are provided a CougarMail account when they enroll in classes at Columbia College. You are responsible for monitoring email from that account for important messages from the College and from your instructor.

Students should use email for private messages to the instructor and other students. The class discussions are for public messages so the class members can each see what others have to say about any given topic and respond.

### Late Assignment Policy

All classes rely on participation and a commitment to your instructor and your classmates to regularly engage in the reading, discussion and writing assignments. You must keep up with the schedule of reading and writing to successfully complete the class.

No late assignments will be accepted without the prior approval of the instructor.

Acceptance of a late assignment is at the discretion of the instructor.

Make-up examinations may be authorized for students who miss regularly-scheduled examinations due to circumstances beyond their control. Make-up examinations must be administered as soon as possible after the regularly scheduled examination period and must be administered in a controlled environment.

### Student Conduct

All Columbia College students, whether enrolled in a land-based or online course, are responsible for behaving in a manner consistent with Columbia College's [Student Conduct Code](#) and [Acceptable Computing Use Policy](#). Students violating these policies or any other College policy will be referred to the office of Student Affairs and/or the office of Academic Affairs for possible disciplinary action. The Student Code of Conduct, the [Student Behavioral Misconduct Policy and Procedures](#), and the Acceptable Computing Use Policy can be found in the Policy Library at [ccis.edu/policies](http://ccis.edu/policies). The adjunct faculty member maintains the right to manage a positive learning environment all students must adhere to the conventions of online etiquette when enrolled in a course with an online component.



