



## BIOL 254L: \*Genetics Laboratory

<b>Location:</b>	Evening
<b>Address:</b>	1001 Rogers Street Columbia, MO 65216
<b>Section:</b>	19FALL2/BIOL/254L/AEV
<b>Semester Credit Hours:</b>	2
<b>Class Day(s) and Time(s):</b>	Tuesday, Thursday 7:45 PM - 10:25 PM from October 21, 2019 to December 14, 2019

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 Course Information

## Catalog Description

Laboratory experiences to complement BIOL 254; methodology and applications in classical and molecular genetics. Students majoring in Biology must earn a grade of C or higher. Cross-listed with ENVS 254L.

**Prerequisites:** BIOL 112L with a grade of C or higher; BIOL 254 with a grade of C or higher, or concurrent enrollment. Additional lab fee applicable to main campus day offerings.

## 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.

 Knisely. (2017). *A Student Handbook for Writing in Biology* (5th). W.H. Freeman & Company. eText

 Mertens/Hammersmith. (2014). *Genetics Laboratory Investigations Master Textbook* (14th). Pearson. Physical Book

## 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 [TruTition<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. Utilize the scientific method to design and conduct experiments.
2. Utilize critical analysis skills to interpret data and draw conclusions.
3. Perform and evaluate methods in classical genetic analysis using bacterial, plant, animal, and fungal organisms.
4. Employ and evaluate methods in molecular genetics.

#### 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
Lab Assignments	500	50%
Examinations	200	20%
Grant Proposal Project	300	30%
<b>Total</b>	<b>1000</b>	<b>100%</b>

#### Schedule of Due Dates

### Week 1

Assignment	Points	Due
Lab Safety Assignment	10	Tuesday
Introduction to Scientific Research & Peer Review Process	--	Tuesday
Lab 2: Principles of Probability	35	Thursday
Lab 3: Chi-Square Test	35	Thursday

### Week 2

Assignment	Points	Due
Lab 4: Cell Reproduction- Mitosis	35	Tuesday
Lab 5: Cell Reproduction- Meiosis	35	Tuesday
Lab 7: Polytene Chromosomes	35	Thursday

### Week 3

Assignment	Points	Due
Lab 8: Sex Chromosomes and Gene Transmission	35	Tuesday
Lab 9: Sex Chromatin in Human Cells	35	Tuesday
Lab 1: Maize Mono/Dihybrid Crosses	35	Thursday

### Week 4

Assignment	Points	Due
Lab 11: Linkage and Crossing Over	35	Tuesday
Lab Midterm Exam	100	Thursday

### Week 5

Assignment	Points	Due
Lab 14: DNA Isolation	35	Tuesday
Lab 15: Restriction Endonuclease Digestion and Gel Electrophoresis	35	Thursday

### Week 6

Assignment	Points	Due
Grant Research Proposals	225	Tuesday
Grant Review Panels and Review Summaries	75	Thursday

### Week 7

Assignment	Points	Due
Lab 16: PCR	35	Tuesday and Thursday
Lab 17: E. coli Transformation	35	Tuesday and Thursday

### Week 8

Assignment	Points	Due
Lab 23: Population Genetics	35	Tuesday
Final Lab Exam	100	Thursday

**Total Points: 1000**

## Assignments

Lab assignments will be formal written lab reports based on the labs completed in class.

The Grant Proposal Project will be completed with a partner to practice grant writing and the research proposal approval process.

## Examinations

Two lab practical exams will include concept-based questions directly from the completed labs.

## ☰ Course Outline

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

### Week 1:

#### Lab Safety Assignment

#### Introduction to Scientific Research & Peer Review Process

#### Lab 2: Principles of Probability

Turn in formal lab report one week after completing the lab.

#### Lab 3: Chi-Square Test

Turn in formal lab report one week after completing the lab.

### Week 2:

#### Lab 4: Cell Reproduction- Mitosis

Turn in formal lab report one week after completing the lab.

#### Lab 5: Cell Reproduction- Meiosis

Turn in formal lab report one week after completing the lab.

#### Lab 7: Polytene Chromosomes

Turn in formal lab report one week after completing the lab.

### Week 3:

#### Lab 8: Sex Chromosomes and Gene Transmission

Turn in formal lab report one week after completing the lab.

#### Lab 9: Sex Chromatin in Human Cells

Turn in formal lab report one week after completing the lab.

#### Lab 1: Maize Mono/Dihybrid Crosses

Turn in formal lab report one week after completing the lab.

### Week 4:

#### Lab 11: Linkage and Crossing Over

Turn in formal lab report one week after completing the lab.

#### Lab Midterm Exam

This midterm will cover labs: 1,2,3,4,5,7,8,9, & 11.

### Week 5:

#### Lab 14: DNA Isolation

Turn in formal lab report one week after completing the lab.

#### Lab 15: Restriction Endonuclease Digestion and Gel Electrophoresis

Turn in formal lab report one week after completing the lab.

### Week 6:

#### Grant Research Proposals

Note: Submit for grading during next class period.

#### Grant Review Panels and Review Summaries

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

### Week 7:

#### Lab 16: PCR

Turn in formal lab report one week after completing the lab.

#### Lab 17: E. coli Transformation

Turn in formal lab report one week after completing the lab.

### Week 8:

#### Lab 23: Population Genetics

Turn in formal lab report on the last day of class.

#### Final Lab Exam

Final lab exam will include labs 14, 15, 16, 17, & 23.

### + 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](https://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.