

BZ 350 MOLECULAR AND GENERAL GENETICS

SPRING 2024

INSTRUCTIONAL TEAM

Instructor: Dr. Harp

Email: elizabeth.harp@colostate.edu

Drop-In Sessions:

Wednesdays, Noon-1:00 PM, Biology room 244

Thursdays, 10:00-11:00 AM via Zoom

See the *Course Information* module in Canvas for the meeting link

GTA: Sean Schult

Email: Sean.Schult@colostate.edu

Drop-In Sessions:

Mondays, 1:00-2:00 PM, Biology room 356

Fridays, Noon-1:00 PM via MS Teams

See the *Course Information* module in Canvas for the meeting link

COMMUNICATION POLICY

Please respect the time of your instructional team; before emailing us with a question, please make sure your question is not already answered in assignment/quiz/exam instructions; the course syllabus; course announcements; the "Ask the Instructional Team" discussion forum; and other likely places on Canvas.

Any e-mail correspondence must originate from your @colostate.edu account, have your full name in the body of the e-mail, and contain "BZ 350" in the subject line. E-mails not meeting these requirements may not be recognized by our e-mail filters, and thus may not be answered. If you email us, please use the @colostate email address (and not from within Canvas). Messages sent from within Canvas are not sent to an email address – they go to the Canvas Inbox, which is not checked as frequently as email.

Responses to emails will be provided within 36 hours Mondays – Fridays. If you have not received a response to an email within 36 hours Monday - Friday, please feel free to send a gentle follow-up – this is best done as a response to your original email. Emails do go missing from time to time, or we just get overly busy, and we do not mind at all if you provide a gentle reminder that your email has not yet been answered (though we hope you will not have to do this!). Please wait at least 36 hours before following up on an unanswered email. Please note that emails sent from non-CSU email accounts often end up in the spam folder; make sure all email communication originates from your CSU email account.

Important course information will be sent using the Canvas *Announcements* tool. Announcements are accessible in the Canvas course shell by clicking on the *Announcements* link in the left navigation menu. Make sure to set your Canvas notification preferences so that you are receiving announcements and other important messages. Find information about how to do this at: [How do I set my Canvas notification preferences as a student?](#)

We do not generally answer course content questions via email. Drop-in sessions are the best places to get your course content questions answered. You can also post questions in the *Ask the Instructional*

Team discussion forum on Canvas. We will periodically check the *Ask the Instructional Team* discussion forum between 9:00 AM and 5:00 PM, Mondays – Fridays (at a minimum). You are also encouraged to answer each other's questions as long as you are not simply providing answers to assignment questions (i.e., just the final answer with no explanation). Being able to clearly answer somebody else's question about a topic is one of the best ways to determine if you actually understand the material.

You can ask your classmates questions about the class in the *Cyber Café* discussion forum. This is also a great place to set up study groups. The instructional team does not monitor this forum. As always, please be respectful and make sure you are adhering to the [Core Rules of Netiquette](#) and [CSU's Principles of Community](#). If you feel somebody needs a reminder of these rules and principles, please make sure to let us know right away.

PREREQUISITES FOR COURSE

(BZ 110, BZ 120 or LIFE 102) and (STAT 201 or STAT 301 or STAT 307, may be taken concurrently; or ERHS 307, may be taken concurrently).

COURSE DESCRIPTION

The goal of this course is to provide an understanding of biological inheritance. Simply put, we will explore why offspring tend to look like their parents and why this resemblance is often incomplete. This is a broad course. Among other things, we will address the statistical methods that are used to study inheritance in entire populations all the way down to the level of the specific molecules and molecular mechanisms that are involved in the transmission of biological information. In the end, the goal is to produce an integrated view of inheritance across these levels and make it clear why genetics is at the core of so many different fields within the biological sciences.

Upon the completion of this course, students will be able to:

- Analyze genetic crosses and patterns of inheritance to deduce information about genes, alleles, and gene functions.
- Apply statistical techniques to interpret genetic data from controlled crosses and natural populations.
- Interpret genetic experiments based on hypothesis testing and the scientific method.
- Explain how genetic information is expressed so it affects an organism's structure and function.
- Explain how DNA is organized at different structural levels (nucleotide, DNA molecule, chromosome)
- Explain the central dogma of molecular biology (and subsequent elaborations) and the key molecules and mechanisms associated with biological inheritance.
- Describe how gene activity can be altered in the absence of DNA changes.
- Explain how the results of molecular genetic studies in model organisms help us understand aspects of human genetics and genetic diseases.
- Describe experimental methods that are commonly used to analyze gene structure, gene expression, gene function, and genetic variants.
- Make connections between the field of genetics and important societal issues, including human health, conservation, and genetic engineering.
- Express complex genetic concepts in writing.

REQUIRED TEXT & REQUIRED SUPPLEMENTAL RESOURCE

Textbook (required): Genetics: From Genes to Genomes *with McGraw-Hill Connect access*, 7th edition, Hartwell et al, 2021.

This course uses Day One Access. This means that you automatically have access to the textbook and the McGraw-Hill Connect website from the first day of class. To access the McGraw-Hill Connect website, which includes access to the digital textbook, go to the Canvas shell for this course and click on *McGraw-Hill Connect* in the left navigation menu.

Find more information about Inclusive Access at the [CSU Bookstore Inclusive Access](#) web page.

EXPECTED TIME COMMITMENT

Academic credit is a measure of the total *minimum* time commitment required of a typical student in a specific course. For a four-credit course, a student can ***expect to spend a minimum of 12 to 15 hours each week*** completing required assignments, readings, videos, and general studying. Achievement of course goals may require more than the minimum time commitment depending on an individual student's academic background and interests. (Calculated from the [Federal Credit Hour Definition, 34CFR 600.2](#))

To best manage your time, schedule specific times that you plan to spend on this course – this will make it less likely that you will find yourself trying to complete assignments at the last minute.

DROP-IN SESSIONS

All students are welcome to attend any of the drop-in sessions (*a.k.a. 'office hours'*). These are fantastic opportunities to get your questions answered. Even if you don't think you have questions, it's a good idea to stop by at least a couple of drop-in sessions each week for at least 20 – 30 minutes. We are familiar with what topics students typically find most challenging and are always ready with examples to work through and questions to discuss that you will almost certainly find helpful.

ETIQUETTE

Students are expected to contribute to the maintenance of an environment that is conducive to learning and that is respectful of others. Because respect for the learning process is critical for success in this course, no behavior that disrupts any student's ability to learn will be tolerated.

Please review the [Ground Rules for Online Discussions](#) for some guidelines and expectations on how to behave in an online learning environment.

COURSE ORGANIZATION

This course is organized by topic into 15 modules. You can find a link to the Modules page in the left navigation menu in the Canvas course shell and on the course Home page. Each module contains: an

introduction; learning objectives; information and links for required readings and videos; and a list of assignments associated with the readings and videos (includes lecture videos and other assigned videos).

Due dates for available assignments can be found by clicking on the Assignments link or the Syllabus link in the left navigation menu in the Canvas course shell.

GRADING POLICY

Individual assignment, quiz, or exam grades will not be curved, but if the class average at the end of the semester is less than 75%, final grades will be curved to bring the class average to 75%. Individual students' fractional final course grade will be rounded to the nearest whole number (e.g., 69.6 = 70 and 69.4 = 69).

Grades will be assigned on the following scale:

Grade	Range
A	90% to 100%
B+	87% to 89%
B	83% to 86%
B-	80% to 82%
C+	77% to 79%
C	70% to 76%
D	60% to 69%
F	0% to 59%

Points earned in this course will come from assignments, quizzes, discussions, and exams (five mini-exams and a comprehensive final exam) and will count towards your final grade according to the following breakdown.

ASSESSMENT	NUMBER (DROPPED)	PTS EACH	TOTAL POINTS	PERCENT OF TOTAL
Discussion: Class Introduction	1 (0)	10	10	1%
Syllabus & Canvas Scavenger Hunt Quiz	1 (0)	10	10	1%
SmartBook Assignments (M-H Connect)	15 (0)	10	150	15%
Module Quizzes (Canvas)	15 (1)	5	70	7%
Weekly Module Reflection Discussions	15 (1)	10	140	14%
Problem Sets	14 (1)	15	210	21%
M-H Connect Reviews (M-H Connect)	6 (1)	30	150	15%
Mini-Exams (Canvas)	5 (1)	40	160	16%
Cumulative Final Exam	1 (0)	100	100	10%
TOTAL POINTS POSSIBLE			1000	100%

Keep a copy of all work created for the course, including work submitted through Canvas course learning management system.

ASSESSMENTS

Assessments for this course fall into the following categories:

CONNECT SMARTBOOK ASSIGNMENTS

Each module will contain one SmartBook assignment that you will complete on the Connect website along with your assigned textbook reading. These are graded as you answer the questions; you do not need to click submit for these assignments to be entered in the gradebook – they are automatically submitted when they are due. Any answers you get wrong will be presented to you again (though the actual question may be different) until you get it right. This means that the fewer questions you answer incorrectly, the fewer questions you will have to answer.

Because you must answer questions correctly to move on, you should be earning 100% on each SmartBook assignment – but only if you complete the assignment! The SmartBook assignments are designed to take most students 1 -2 hours in total, split over multiple sessions. You should work through the SmartBook assignments as you view the lectures. Lecture material and SmartBook topics will mostly overlap, though there may be topics covered in the SmartBook assignments that are not covered in the lecture material, or that is covered in a different way.

IMPORTANT: For your Connect assignment grades to correctly sync with the Canvas grade book, you must access the Connect website using the links in the Canvas shell for this course.

WEEKLY MODULE REFLECTION DISCUSSIONS

A Reflection Discussion is associated with each module. Active participation in online discussions helps create a learning community and gives you opportunities to work with and get to know other students. You must post at least three times to each module reflection. One post should be your response to the discussion prompt. The other posts should be thoughtful responses to the posts of at least two different classmates. Your grade on the discussion board is based on participation and the quality of your posts. To receive full credit, you must fulfill some basic requirements:

- Posts should be a minimum of 150 words, but keep in mind that the quality of your post is far more important than the number of words. This minimum word count is provided simply to point out that short, trivial responses are not sufficient to receive credit for a post.
- Posts should be relevant to the topic being discussed but should also attempt to introduce a new point of view or piece of information or otherwise further the discussion.
- Posts should use correct grammar, punctuation, and vocabulary appropriate for a university science course.
- Please review the Core Rules of Netiquette (posted on Canvas) for some guidelines and expectations on how to behave in an online learning environment.

Please make sure to review the Module Reflection Discussion Rubric so that you are familiar with how your posts will be graded. Instructions for accessing the rubric can be found in the instructions for each reflection discussion.

MODULE QUIZZES

There will be a Canvas quiz associated with each module. These quizzes will typically be 5-10 questions worth a total of 5 points. Module Quizzes are not timed. You must click “submit” for your quiz to be submitted to Canvas. You will be allowed two attempts (but see restrictions) to complete each quiz; your best score will be recorded in Canvas. While you are allowed two attempts at each Module Quiz, you will not have access to the 2nd attempt until 24 hours after you have submitted your first attempt. This restriction is an implementation of a pedagogical technique known as Spaced Repetition. I encourage you to learn more about it and try to incorporate it into your learning where possible. You can find more information at [this link](#).

PROBLEM SETS

Each week you will submit one problem set via Canvas. These will be a mix of quantitative and short answer questions, including questions from case studies and worksheets. Problem sets will be available via the quiz feature in Canvas. However, unlike the weekly module quizzes, the module problem sets will only allow one attempt.

M-H CONNECT REVIEW ASSIGNMENTS

There will be several Connect review assignments consisting of a variety of question types, including multiple choice, composition, classification, and ordering. The review assignments are not timed, and you are allowed two attempts for each review; I hope you will use these reviews as a study tool, and not as just a “one time” assignment. Your best score will be recorded in the grade book. For each question you are allowed to check your work twice before submitting the question (a *total* of two times, no matter how many attempts at the assignment).

IMPORTANT: For your Connect assignment grades to correctly sync with the Canvas grade book, you must access the Connect website using the links in the Canvas shell for this course.

MINI-EXAMS

There will be five mini-exams in this course that will be administered using Canvas. These exams will be timed, and will include a mix of multiple choice, short answer, and quantitative problems. All exams other than the final exam will be available from 5:00 PM Thursday until 5:00 PM Monday (see specific dates in Canvas); each exam must be submitted before 5:00 PM the day it is due.

If you have a documented University-approved reason for being unable to take an exam during the scheduled exam window, you must email Dr. Harp at elizabeth.harp@colostate.edu at least one week in advance of the scheduled exam window to arrange an alternative time to take the exam. Exams taken outside the scheduled exam window will cover the same material, but may consist of different questions (e.g., may consist entirely of short answer or essay questions), and may be proctored by a member of the instructional team via Zoom or by using University-approved proctoring software.

The final exam is cumulative, and must be taken during the scheduled exam window, which is timed to overlap the final exam period of the in-person class.

COURSE POLICIES (LATE ASSIGNMENTS, REGRADING, ETC.)

Assignments and quizzes submitted after they are due will have a 5% point deduction for each one-hour block they are late. For example, if an assignment is worth 20 points, and you submit it 10 minutes after it is due, your final score would be reduced by one point. This late penalty is automatically assessed by Canvas. If you have SDC accommodations that allow an extension on a limited number of assignments, you must request this extension in advance for each assignment.

You are allowed once during the semester to submit one Homework Quiz or Problem Set within 24 hours after the due date without penalty. This does *not* apply to Exams or McGraw-Hill Assignments. This policy is intended to compensate for any unexpected internet outages, other technical difficulties (e.g., computer failure), and other situations that might prevent you from submitting a Homework Quiz or Problem Set on time. Any additional late problem sets or quizzes will be assessed the late penalty as detailed above. There will be no exceptions to this rule – please do not ask.

To claim your “penalty-free” late assignment, you must send an email to the instructor and the GTA with your request *before* the Homework Quiz is due; there is no need to explain the reason your homework quiz will be late. Requests sent after the due date & time are not guaranteed to be seen in time for you to take advantage of the 24-hour window. Please note that assignments turned in after the due date and time may take substantially longer to be graded.

Keep in mind that technology can fail at the most inopportune times. Computer crashes, internet outages, and similar circumstances will not be considered valid excuses for late work – please plan to complete your work in plenty of time to allow for any circumstances that could delay completion or submission of your work.

For your Connect assignment grades to correctly sync with the Canvas grade book, you must access the Connect website using the links in the Canvas shell for this course.

If students have concerns about grading, they must submit a written request for regrading within two business days (48 hours, not including weekends) of when the assessment grade was released.

All regrade requests must clearly indicate the questions being submitted for regrading along with a clear and detailed explanation of why you believe the question(s) should be regraded. Simply stating “*I don’t understand why I lost points*” is not sufficient. Submit regrade requests through Canvas, being careful to follow all instructions. Regrade requests sent via email will not be considered.

For any regrade requests, the entire assessment (not just individual questions) may be regraded. Therefore, it is possible to *lose* points on a regrade if we find that credit was mistakenly given for incorrect answers.

SYSTEM, MULTIMEDIA, AND SOFTWARE REQUIREMENTS

Because this is an online course, it is expected that you have your own computer and reliable internet access with bandwidth suitable for streaming high-quality video. You will also need access to a webcam and microphone if your computer does not already have these built in (most laptops are equipped with

both). You must have speakers or headphones installed and working properly on your computer before beginning this course.

If you are having trouble with the multimedia in this course or with accessing Microsoft Office products, find solutions to a number of common problems at [System, Multimedia, and Software Requirements](#). Also, it is highly recommended that you access your course via a **high-speed Internet connection**.

Still having issues? Call the **CSU Help Desk at 970-491-7276** or [Email Help Desk Support](#).

Did you know you can purchase a computer using scholarship funds or your student account?

- Contact RamTech at ramtech@colostate.edu for more information.

Did you know that all current CSU students may download – free of charge – the full version of Microsoft Office on up to five computers?

- Find more information on the [ACNS Software Downloads](#) web page.

TECHNICAL SUPPORT

Canvas is where course content, grades, and communication will reside for this course.

- Login: canvas.colostate.edu
- Support: info.canvas.colostate.edu
- For passwords or any other computer-related technical support, contact the [Central IT Technical Support Help Desk](#).
 - (970) 491-7276
 - help@colostate.edu

The [Technical Requirements](#) page identifies the browsers, operating systems, and plugins that work best with Canvas.

Need technical assistance with the McGraw-Hill Connect Website?

- McGraw-Hill Connect Customer Experience Team: 1-800-331-5094
- McGraw-Hill Connect Support and Service website:
<https://www.mheducation.com/highered/support/connect.html>
- You can also access support from within the Connect website for this course.

TUTORING & OTHER LEARNING RESOURCES

Free online tutoring may be available for this course through the Arts & Sciences Tutoring Program coordinated by The Institute for Learning and Teaching (TILT). If you are on campus, free in-person tutoring is available in the TILT building during scheduled times. For more information and for links to additional learning resources, please visit: <https://tilt.colostate.edu/Undergrad>.

ACADEMIC INTEGRITY & CSU HONOR PLEDGE

This course will adhere to the CSU [Academic Integrity/Misconduct](#) policy as found in the General Catalog and the [Student Conduct Code](#).

It is not acceptable to copy answers from another student's assignment, the text, or any other source. Unless the source and author are cited and the work placed in quotation marks, a copied answer is plagiarism. Furthermore, even if a work is properly cited, it is as unacceptable to copy someone else's work or any other resource. Recognizably copied answers will receive zero credit and be considered cheating.

Academic integrity lies at the core of our common goal: to create an intellectually honest and rigorous community. Because academic integrity, and the personal and social integrity of which academic integrity is an integral part, is so central to our mission as students, teachers, scholars, and citizens, I will ask that you affirm the CSU Honor Pledge as part of completing your work in this course.

Referring to solutions manuals, looking at assignments from previous semesters, and working in groups on assignments is perfectly acceptable (working in groups is especially encouraged), but your submitted work must be in your own words.

Further information about Academic Integrity is available at [CSU's Academic Integrity – Student Resources](#)

UNIVERSAL DESIGN FOR LEARNING/ ACCOMMODATION OF NEEDS

I am committed to the principle of universal learning. This means that our virtual spaces, our practices, and our interactions be as inclusive as possible. Mutual respect, civility, and the ability to listen and observe others carefully are crucial to universal learning.

If you are a student who will need accommodations in this class, please contact me to discuss your individual needs. Any accommodation must be discussed in a timely manner. A verifying memo from [The Student Disability Center](#) may be required before any accommodation is provided.

The Student Disability Center (SDC) has the authority to verify and confirm the eligibility of students with disabilities for the majority of accommodations. While some accommodations may be provided by other departments, a student is not automatically eligible for those accommodations unless their disability can be verified and the need for the accommodation confirmed, either through SDC or through acceptable means defined by the particular department. Faculty and staff may consult with the SDC staff whenever there is doubt as to the appropriateness of an accommodative request by a student with a disability.

The goal of SDC is to normalize disability as part of the culture of diversity at Colorado State University. The characteristic of having a disability simply provides the basis of the support that is available to students. The goal is to ensure students with disabilities have the opportunity to be as successful as they have the capability to be.

Support and services are offered to student with functional limitations due to visual, hearing, learning, or mobility disabilities as well as to students who have specific physical or mental health conditions due

to epilepsy, diabetes, asthma, AIDS, psychiatric diagnoses, etc. Students who are temporarily disabled are also eligible for support and assistance.

Any student who is enrolled at CSU, and who self-identifies with SDC as having a disability, is eligible for support from SDC. Specific accommodations are determined individually for each student and must be supported by appropriate documentation and/or evaluation of needs consistent with a particular type of disability. SDC reserves the right to ask for any appropriate documentation of disability in order to determine a student's eligibility for accommodations as well as in support for specific accommodative requests. The accommodative process begins once a student meets with an accommodations specialist in the SDC.

THIRD-PARTY TOOLS/ PRIVACY

Please note that this course may require you to use third-party tools (tools outside of the Canvas learning management system), such as Zoom and others. Some of these tools may collect and share information about their users. Because your privacy is important, you are encouraged to consult the privacy policies for any third-party tools in this course so that you are aware of how your personal information is collected, used and shared.

COPYRIGHTED COURSE MATERIALS

Please do not share material from this course in online, print, or other media. Course material is the property of the instructor who developed the course. Materials authored by third parties and used in the course are also subject to copyright protections. Posting course materials on external sites (commercial or not) violates both copyright law and the CSU Student Conduct Code. Students who share course content without the instructor's express permission, including with online sites that post materials to sell to other students, could face appropriate disciplinary or legal action.

UNDOCUMENTED STUDENT SUPPORT

Any CSU student who faces challenges or hardships due to their legal status in the United States and believes that it may impact their academic performance in this course is encouraged to visit [Student Support Services for Undocumented, DACA & ASSET](#) for resources and support. Additionally, only if you feel comfortable, please notify your professor so they may pass along any additional resources they may possess.

TITLE IX/ INTERPERSONAL VIOLENCE

For the full statement regarding role and responsibilities about reporting harassment, sexual harassment, sexual misconduct, domestic violence, dating violence, stalking, and the retaliation policy please go to: [Title IX – Sexual Assault, Sexual Violence, Sexual Harassment](#).

If you feel that your rights have been compromised at CSU, several resources are available to assist:

- [Student Resolution Center](#), 491-7165
- [Office of Equal Opportunity](#), 491-5836

A note about interpersonal violence: If you or someone you know has experienced sexual assault, relationship violence and/or stalking, know that you are not alone. As instructors, we are required by law to notify university officials about disclosures related to interpersonal violence. Confidential victim advocates are available 24 hours a day, 365 days a year to provide support related to the emotional, physical, physiological and legal aftermath of interpersonal violence. Contact the [Victim Assistance Team](#) at: 970-492-4242.

RELIGIOUS OBSERVANCES

CSU does not discriminate on the basis of religion. Reasonable accommodation should be made to allow individuals to observe their established religious holidays. Students seeking an exemption from attending recitation or completing assigned course work for a religious holiday will need to fill out the [Religious Accommodation Request Form](#) on the Division of Student Affairs website.

Once turned in, the Division of Student Affairs will review the request and contact the student accordingly. If approved, the student will receive a memo from the Dean of Students to send to their instructor.

Students are asked to submit the request form as soon as the conflict is noticed. Similarly, unanticipated conflicts requiring a religious observance, such as a death in the family, can also be reviewed.

CSU PRINCIPLES OF COMMUNITY

Inclusion: We create and nurture inclusive environments and welcome, value and affirm all members of our community, including their various identities, skills, ideas, talents and contributions.

Integrity: We are accountable for our actions and will act ethically and honestly in all our interactions.

Respect: We honor the inherent dignity of all people within an environment where we are committed to freedom of expression, critical discourse, and the advancement of knowledge.

Service: We are responsible, individually and collectively, to give of our time, talents, and resources to promote the well-being of each other and the development of our local, regional, and global communities.

Social Justice: We have the right to be treated and the responsibility to treat others with fairness and equity, the duty to challenge prejudice, and to uphold the laws, policies and procedures that promote justice in all respects.

DIVERSITY AND INCLUSION

The [Mission and Vision web page](#) of the CSU Commission on Diversity and Inclusion includes a comprehensive statement of CSU's commitment to diversity and inclusion.

Additional resources and information about CSU's commitment to diversity and inclusion can be found on the [web page of the CSU Office of the Vice President for Diversity](#).

I am committed to fostering and maintaining a positive online learning environment where all students feel welcomed, respected, and safe. If you feel that these values are not being upheld by one or more members of our online community, I encourage you to let me know and/or to get in touch with a member of the Office of the Vice President for Diversity. Visit <https://diversity.colostate.edu/about/our-team/> to view the directory of the members of the Vice President for Diversity Team.

Thank you for taking time to read the syllabus! Please post questions about syllabus content in one of the informal discussion boards on Canvas: The *Cyber Café* discussion board or the *Ask the Instructor* discussion board.

~Dr. Harp