Syllabus—Fall 2021
BIOL 3003—Genetics

Instructor
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Office hours: Tues 2:00–4:00 pm or by appt.

Course Details

Credits: 3
Time and Place: Online, Asynchronous
Prerequisites: BIOL 1020 (Principles of Biology)
Course materials: Genetic Analysis: An Integrated Approach 3rd Ed; Sanders and Bowman

Course description

An overview of theoretical principles of transmission, cytological, molecular, and population genetics. Principles learned are applied to advanced applications in modern genetics research. Problem solving will be emphasized.

Course Objectives and Outcomes

- Internalize the scientific method
- Increase your scientific literacy
- Learn genetic principles and techniques
- See the integrative ability of genetics with other scientific disciplines
- Understand genetics' impact on and interaction with society

Student Learning Outcomes:

The Department of Biological Sciences (DBS) has developed a set of student learning outcomes (SLOs). The key DBS student learning outcomes that we will address in BIOL 3003 are:

- SLO 1: Students will be able to critically review scientific articles in the life sciences. They will be able to recognize the tested hypothesis (or hypotheses) and identify the strengths, weaknesses, and major intellectual contributions of the articles.

- SLO 2: Students will be able to effectively locate, evaluate, and summarize published information int he life sciences. They will be able to identify appropriate sources for specific information needs and use appropriate search tools and search strategies to access needed information.
- SLO 4: Students will be able to communicate effectively to the appropriate audience in the written genres common to biological sciences (e.g., lab reports, research articles). Components of successful written communication include the effective organization of scientific content, appropriate use of language, and correct use of scientific citations.
- SLO 5: Students will be able to apply the scientific method to formulate testable hypotheses, gather data that address the hypotheses, and analyze the data (statistically, graphically) to assess the degree to which their scientific work tests their hypotheses and draw appropriate conclusions from the data.
- SLO 6: Students will develop their metacognitive skills. Metacognition is defined as the process by which students reflect on and communicate about their role in learning. Reflection and communication may include: 1. Awareness of choices made in response to the opportunities (i.e. homework, office hours, review sessions) and constraints (i.e. challenging problems, short time frames) on learning, and/or; 2. Evaluation of the success of such choices, particularly across tasks and contexts. Ultimately, these activities should help students develop and articulate their science knowledge and its value to their professional and life long learning goals.

Course Assignments and Grading

Course points

Item	Points
Assignments	250
Quizzes	200
Midterm Exams	400
Final Exam	150
Total:	1000

Letter grade distribution

Percentage	Grade
>= 90.0	A
80.0 – 90.0	B
70.0 – 80.0	C
60.0 – 70.0	D
<60.0	F

Course Structure

The course will follow this general pattern:

- Each Monday afternoon I will post a short (∼20 minute) video. These videos will include announcements about current modules, deadlines, exams, questions from students, and other information. I will announce the video posting and location via Canvas announcement. You are responsible to watch the videos within 24 hours of their posting.
- At the start of each online module, students will see an overview of what topics will be covered in that module. Each section of the module is meant to be covered sequentially and each module must be completed in order.
- Students will read through the information on the Canvas module pages at their own pace prior to the module deadline, watch and take notes on videos that are included, and interact with images, diagrams, and animation on each page to facilitate learning and retention of material.
- Students will complete a PackBack assignment, wherein they will ask a question (due Thursday evening) and post two responses (due Sunday evening). See PackBack section below for more details.
- There may also be other Canvas assignments that the instructor assigns during the semester.
- Students will complete each module quiz by Sunday evening.

Quizzes and Exams

Quizzes

There will be a total of 10 quizzes throughout the semester. These quizzes will be composed of multiple choice questions, short answer questions and even short writing assignments. Quizzes are open-note (students can use their notes and class materials), but not open-person (students cannot communicate with other people or use the notes of others). Due dates will be posted by quizzes can be submitted at any time prior to when it is due.

Exams

There are a total of five exams throughout the semester. four of those are during the semester (midterms) and will be available on Fridays. Be sure to look at the syllabus and the exam schedule to know when those days are. Exams will typically open at 7:00am on those Fridays and close at 10:00pm that day. You will be able to take the exam at any time during those hours. Exams will be timed (length of each exam will be listed in the exam instructions). Exams are open-note (students can use their notes and class materials), but not open-person (students cannot communicate with other people or use the notes of others). The final exam will be given during the scheduled finals week, and will follow the same general structure as the midterm exams.

1 Schedule

Module 0: Introduction	Learning material: Reading: PackBack Activity: Quiz 0 due date:	Syllabus, How to Succeed in this Class, and Inductive / Deductive Reasoning Skills Syllabus Getting to know you survey August 16
Module 1: Basic Biology Review	Learning material: Reading: PackBack Activity: Quiz 1 due date:	Cellular structure, the central dogma, and reading scientific papers Textbook 1.1, 1.2, and 1.3 How to read a scientific manuscript August 22
Module 2: Cellular Division & Reproduction	Learning material: Reading: PackBack Activity: Quiz 2 due date:	Mitosis, Meiosis, Sexual Reproduction, and Asexual Reproduction Textbook 1.4, 3.1, and 3.2 Textbook practice problems August 29
End of Exam I Material. Exam I: September 3		
Module 3: Mendelian Genetics	Learning material: Reading: PackBack Activity: Quiz 3 due date:	Gregor Mendel and Principles of Inheritance Textbook 2.1, 2.2, 2.3, and 2.4 Is genetics a diverse field? September 5
Module 4: Non-Mendelian Genetics pt 1	Learning material: Reading: PackBack Activity: Quiz 4 due date:	Incomplete Dominance, Codominance, Pleiotropy, Lethal Genes, and Multiple Alleles Textbook 4.1 and 4.2 Exam I review September 12
Module 5: Non-Mendelian Genetics pt 2	Learning material: Reading: PackBack Activity: Quiz 5 due date:	Epistasis, Sex-linked Traits, and Sex Determination Textbook 3.3, 3.4, 3.5, and 4.3 Create a practice problem September 19
Module 6: Non-Mendelian Genetics pt 3	Learning material: Reading: Activity: Quiz 6 due date:	Gene Linkage, Recombination, Gene Mapping Textbook 5.1, 5.2, 5.3, 5.4, and 5.5 Textbook practice problems October 26
End of Exam II Material. Exam II: October 1		
Module 7: Cytogenetics	Learning material: Reading: Activity: Quiz 7 due date:	Chromosome Structure, DNA Packaging, Ploidy Variation Textbook 10.1, 10.2, 10.3, and 10.6 What concept challenges you? October 3
Module 8: Molecular Genetics pt 1	Learning material: Reading: Activity: Quiz 8 due date:	Genome Complexity, DNA Replication, Sources of Mutation, Types of Mutations Textbook 7.1, 7.2, 7.3, 7.4, 11.1, 11.2, 11.3, and 11.4, 11.6, and 11.7 Exam II Review October 10
Module 9: Molecular Genetics pt 2	Learning material: Reading: Activity: Quiz 9 due date:	Transcription, Regulation, Translation, Introduction to -Omics Textbook 13.1, 13.2, and 13.3 Textbook practice problems October 17
End of Exam III Material. Exam III: October 22		
Module 10: Evolutionary Genetics pt 1	Learning material: Reading: Activity: Quiz 10 due date:	Basics of Evolution, Hardy-Weinberg Equilibrium, Population Structure Textbook 1.5, 20.1 Create a practice problem October 24
Module 11: Evolutionary Genetics pt 2	Learning material: Reading: Activity: Quiz 11 due date:	Selection and Phylogenetics Textbook 16.3, 20.7, and 20.8 Create a practice problem October 31
End of Exam IV Material. Exam IV: November 5		
Module 12: Advanced Applications: Bioinformatics	Learning material: Reading: Activity: Quiz 12 due date:	Genbank, Alignments, Computational Phylogenetics, Genomics, & Proteomics Textbook 16.1, 16.2, and 16.4 Create a practice problem November 7
Module 13: Advanced Applications: Biotechnology	Learning material: Reading: Activity: Quiz 13 due date:	Gene Manipulation, Meiotic Drive Textbook 14.3, nature.com/articles/nbt.4245 What concept challenges you from Kyrou et al. (2018)? November 14
Module 14: Advanced Applications: Genetics & Society	Learning material: Reading: Activity: Quiz 14 due date:	History of Genetics, Eugenics, Evolution science.org/doi/full/10.1126/science.abm4415, Non-overlapping Magisteria Ask question you have regarding history of genetics, eugenics, or evolution and society November 21
Module 15: Material Review / Flex Week	Quiz 15 due date:	December 5
End of Class Material. Final Exam: December 10		

Packback

Participation is a requirement for this course, and the Packback Questions platform will be used for online discussion about class topics. Packback is an online community where you can ask open-ended questions to build on top of what we are covering in class and relate topics to real-world applications.

Packback Requirements

Your participation on Packback will count toward 10% of your overall course grade. PackBack activities will have a Sunday at 11:59 PM (central time) deadline for submissions. In order to receive your points per week, you should submit the following per each deadline period:

- 1 open-ended Question per week with a minimum Curiosity Score of 50, worth 33.33% of each assignment grade
- 2 Responses per week with a minimum Curiosity Score of 50, worth 66.67% of each assignment grade
- Half credit will be provided for questions and responses that do not meet the minimum curiosity score.
- The instructor will decide the grade for each PackBack assignment considering (but not depending on) the Curiosity Score.

Helpful Tips

In order to get full credit on your PackBack activities, make sure to use the following hints:

1. Look to the left of your screen when you reply. Make note of the Curiosity score under the Instant Feedback tab. This will need to be a minimum of 50 on both the question and 2 responses in order to receive full credit (10 points)
2. One way to help your curiosity score is to cite a reference. Either a reputable website or your book would help to add to the curiosity score.
3. Don't post closed questions. Start with words like "Why" or ask for opinions if you question is thrown out for being a "closed question".
4. Check your post before the due date (Sunday at 11:59 pm central time) to make sure your question/response was not flagged or moderated for not meeting the community standards (plagiarism, closed ended question, class logistics or low effort/detail post).
5. When you have trouble, the best thing to due is contact the Packback support team. I know that usually these support services brag about their quick service, but Packback actually does have a relatively quick response time to issues.

Packback Registration

An email invitation will be sent to you from help@packback.co prompting you to finish registration. If you don't receive an email (be sure to check your spam), you may register by following the instructions below:

1. Create an account by navigating to https://questions.packback.co and clicking "Sign up for an Account" Note: If you already have an account on Packback you can log in with your credentials.

2. Then enter our class community's lookup key into the "Looking to join a community you don't see here?" section in Packback at the bottom of the homepage. (Community Lookup Key: ea7dfd57-6bd8-474e-8275-b7f1041ae619)

3. Follow the instructions on your screen to finish your registration.

Course Policies

Class Inclusiveness

It is our intent that students from all backgrounds and perspectives be well-served by this course. We are committed to creating an inclusive space that fosters diversity along its many axes: ethnicity, race, sex, gender, disability, age, socioeconomic status, nationality, and culture. As your instructors and as a student in this class, it is our shared responsibility to develop and maintain a positive learning environment for everyone. Any type of discrimination or aggression toward your peers or instructors will not be tolerated. If you experience any form of discrimination in this course, either from us (the instructors) or your peers, please submit an anonymous message via the Feedback tool in Canvas. For more information about this tool, please see wp.auburn.edu/biggio/canvas-feedback-box/.

Late Assignment Policy

It is very important that students submit work on time, or they will find it very difficult to catch up. All work in the course (e.g., assignments, discussions, exams, quizzes, etc.) will be due by 11:59 pm CT on the date noted on the class calendar. Students should reach out to their instructor immediately to discuss any concerns.

Makeup Policy

Students who miss the normal exams will need to contact the instructor and turn in the valid excuse within 48 hours from the time that the exams were given. The makeup exam schedule is determined by the instructor and will need to be done within ONE week (5 work days) from the time that the exams were given. The format, questions and difficulty-level of make-up exams are not guaranteed to be same as the normal exam, which are at the discretion of the instructors. The student and the instructor will agree upon a date and time for the makeup exam. Valid excuses include: 1). illness documented by a physician. 2) evidence of personal or family emergency. 3) official university excuses.

Instructor Communication Policy

Additionally, it is your responsibility to read course announcements sent by your instructor (over Canvas and through email). Your Auburn University email address is the university-approved form of communication between instructors and students. Students should give the instructor 48 hours to get back to them on any communication, and one week for grading turnaround time on major assignments.

Academic Integrity

Academic dishonesty is an offense that will be reported to the Academic Honesty Committee. Please refer to the following document for further information regarding academic honesty: Auburn University Student Academic Honesty Code

Accessibility
Students who need accommodations are asked to electronically submit their approved accommodations through AU Access and to arrange a meeting during office hours the first week of classes, or as soon as possible if accommodations are immediately needed. If you need accommodations but have not established them, make an appointment with the Office of Accessibility, 1228 Haley Center, 334-844-2096.

2 Withdrawal deadlines

Please see the AU Academic Calendar for the most up-to-date deadlines for withdrawing from this course without a financial or grade penalty.

3 COVID-related Policies

Due to the Coronavirus pandemic, public health measures have been implemented across Auburn's campus. Students should stay current with these practices and expectations through the campus reentry plan, A Healthier U. The sections below provide expectations and conduct related to COVID-19 issues.

3.1 Health and participation in class

You are expected to complete your Healthcheck screener daily.

Your health and safety, and the health and safety of your peers, are my top priorities. If you are experiencing any symptoms of COVID-19, or if you discover that you have been in close contact with others who have symptoms or who have tested positive, you must follow the instructions on the Healthcheck app. My hope is that if you are feeling ill or if you have been exposed to someone with the virus, you will stay home to protect others.

Please do the following in the event of an illness or COVID-related absence:

- Notify me in advance of your absence, if possible
- Keep up with coursework as much as possible
- Participate in class activities and submit assignments remotely as much as possible
- Notify me if you require a modification to the deadline of an assignment
- Finally, if remaining in a class and fulfilling the necessary requirements becomes impossible due to illness or other COVID-related issues, please let me know as soon as possible so we can discuss your options

Students with questions about COVID-related illnesses should reach out to the COVID Resource Center at (334) 844-6000 or at ahealthieru@auburn.edu.

3.2 Health and well-being resources

These are difficult times, and academic and personal stress is a natural result. Everyone is encouraged to take care of themselves and their peers. If you need additional support, there are several resources on campus to assist you:

- COVID Response Team (ahealthieru.auburn.edu)
- Student Counseling and Psychological Services (http://wp.auburn.edu/scs/)

- AU Medical Clinic (https://cws.auburn.edu/aumc/)

If you or someone you know are experiencing food, housing or financial insecurity, please visit the Auburn Cares Office (http://aucares.auburn.edu/).

3.3 A Healthier U campus community expectations

We are all responsible for protecting ourselves and our community. Please read about student expectations for fall semester, including completing the daily GuideSafe^{TM} Healthcheck (https://ahealthieru.auburn.edu/).

You are expected to (1) take your temperature daily and (2) complete your Healthcheck screener to receive your A Healthier U pass.

3.4 Course expectations related to COVID-19

- Course Attendance: If you are quarantined or otherwise need to miss class because you have been advised that you may have been exposed to COVID-19, you will be expected to develop a plan to keep up with your coursework during any such absences.

- Course Meeting Schedule: This course might not have a traditional meeting schedule. Be sure to pay attention to any updates to the course schedule as the information in this syllabus may have changed. Please discuss any questions you have with me.

- Technology Requirements: This course may require particular technologies to complete coursework. If you need access to additional technological support, please contact the AU Bookstore at aubookstore@auburn.edu.

3.5 Course delivery changes related to COVID-19

Please be aware that the situation regarding COVID-19 is frequently changing, and the delivery mode of this course may adjust accordingly. In the event that the delivery method is altered, please be assured that the learning goals and outcomes of the course will not change; however, some aspects of the course will change in terms of the mode of delivery, participation, and testing methods. Those details will be shared via Canvas as soon as possible. Please be prepared for this contingency by ensuring that you have access to a computer and reliable Internet.