BIOL 305: Genetics

Faculty Instructor: Dr. Chris Korey
Office Location: RITA 207
Office Hours: T:11:30 - 1:00, F: 9 -10:30, by Appointment
Email: koreyc@cofc.edu
Phone: 843-953-7178

Section 01 - MWF: 11-11:50 am; RITA 103
Section 02 - MWF: 1-1:50 pm; RITA 152

Course Description: The basics of the science of heredity. The course encompasses Mendelian genetics, the molecular basis of inheritance, changes in chromosome number and structure, gene mapping, mutations and population genetics. Population and quantitative genetic approaches are applied to clarify the understanding of evolution.

- Prerequisite(s): BIOL 111/BIOL 111L and BIOL 112/BIOL 112L.
- Co-requisite(s) or Prerequisite(s): BIOL 211 and BIOL 211D, MATH 250 or equivalent course in statistics or permission of instructor.

What materials do I need to take this course?

Readings and Practice Problems: We will make extensive use of the textbook, Genetics - A Conceptual Approach by Benjamin Pierce. There will be assigned readings and practice problems from this book. Find your cheapest option: The 6th edition (in Bookstore) and 5th edition are almost identical. The 4th edition has some larger differences, but nothing that would prevent its use. Reddit has links to pdf downloads of the 5th and 4th if you are fine with electronic only - these are in OAKs. If you would like a hardcopy of the text, I would recommend a used version of the 5th edition. These can be found for less than $10 online.

- This google sheet provides page and problem comparisons

Technology: Reliable Internet Access, Computer, Access to OAKs

Technology Note: It is important to identify and solve technical issues as quickly as possible. It is a general policy for this course that computer failure or internet connectivity unavailability does not constitute an excuse for not completing assignments on time.
What are important dates I should make note of in my calendar?

I maintain a comprehensive course calendar with the course topics, readings, suggested problems, and due dates. In the case our schedule changes (due to weather, class cancellations, etc.), I will update the course calendar online as soon as I can.

Wednesday, 8/21: First Day of Class
Monday, 9/2: Problem Set 1 Due
Monday, 9/9: Problem Set 2 Due
Friday, 9/13: Take Home Exam 1 Handed Out
Monday, 9/23: Problem Set 3 Due
Monday, 9/30: Problem Set 4 Due
Friday, 10/4: Take Home Exam 2 Handed Out
Monday, 10/14: Fall Break - No Class
Wednesday, 10/16: Midterm Grades Due
Friday, 10/18: Problem Set 5 Due
Friday, 10/25: Withdrawal Date
Monday, 10/29: Problem Set 6 Due
Friday, 11/1: Take Home Exam 3 Handed Out
Monday, 11/11: Problem Set 7 Due
Monday, 11/18: Problem Set 8 Due
Friday, 11/22: Take Home Exam 4 Handed Out
Monday, 10/29: Problem Set 6 Due
Friday, 12/6: Final Exam (MWF 11am Section)
Wednesday, 12/11: Final Exam (MWF 1pm Section)

Final Exam Period Note: I have two sections of this course. Unless you have multiple finals on the same day, you are required to take your final exam on the scheduled final exam period for the course. Students in the MWF 1pm section cannot take the final exam on the earlier date associated with the MWF 11am section. Make your end of semester travel plans accordingly. An early flight home is not an acceptable reason for requesting the earlier exam time.


Hurricane Season Note From the College: If the College of Charleston closes and members of the community are evacuated due to inclement weather, students are responsible for taking course materials with them in order to continue with course assignments consistent with instructions provided by faculty. In cases of extended periods of institution-wide closure where students have relocated, instructors may articulate a plan that allows for supplemental academic engagement despite these circumstances.

Do I need to come to class on a regular basis?

The short answer is - yes! In my experience, students who do not attend class regularly often struggle to keep up with the pace of the material in our course. By coming to class regularly, focusing on the material during class time, and by asking questions when you are confused, your understanding of the material will be higher than if you worked on the same material at home.

It’s important that you come to class on time, ready to work; that you stay for the entire class period; and that you are working on genetics while you are here. I will be taking attendance every day. If you arrive to class more than five minutes late, leave class more than five minutes early, or if you are found doing activities other than those related to our course, I reserve the right to mark you “absent” from class that day.

Any student who misses four class meetings, for any reason, will be reminded of our “WA” Policy via email. Any student who misses five class meetings, for any reason, will be subject to a “WA” Grade for the course. Note that this is computed in your GPA the same as as an “F” grade.
Sometimes, life happens…

I also understand that you all have other courses, life responsibilities, jobs, and families. Sometimes, life takes an unexpected turn. However, that shouldn’t prevent you from being successful in this class. Please do not hesitate to talk to me about any personal issues (you do not have to provide specifics) that arise during the semester so that we can arrange for the assistance you may need and make reasonable accommodations for you to complete missed work.

**Why kind of assignments can I expect?**

We will cover 24 standards that encompass the core concepts and learning objectives in this genetics course. These standards are based on the Core Concepts and Competencies in Genetics developed by the Genetics Society of America. The assignments in this course give you multiple opportunities to work on mastering each standard. Successfully completing all 24 standards during the course will provide you with a broad understanding of the field.

**Practice Problems:** The detailed course calendar lists suggested problems from the textbook. They will not be collected or graded. These are the first opportunity you will have to build your understanding of the course’s core concepts and learning objectives. You can work on these with other students. I am happy to discuss them with you as you work through difficulties you may be having.

**Problem Sets:** There are 8 problem sets during the semester. These problem sets build on the suggested problems from the textbook and provide you an opportunity to test your mastery of particular standards. You are allowed to discuss the problems with other students in the course.

**Genetics Abstracts:** These are a low stakes exploration of the world of genetics. You will submit abstracts of genetics research that are of interest to you, explain the connection to a concept in class, and suggest an exam question based on the abstract (see example in OAKs) - I’ll likely use some on exams during the semester. Only one abstract can be submitted each week. You will need to submit 8 of these over the course of the semester to earn an A in the course.

**Course Exams:** There will be 4 take-home exams during the semester. These will be handed out in class on a Friday and will be due in class the following Monday. Each exam question will be mapped to a particular course standard.

**Final Course Exam:** The final course exam will serve two purposes. First, it will be a moment when you can re-assess standards from the 4th exam that you did not complete. This will also be a limited cumulative exam that will cover a subset of the 24 standards - the specific standards on the exam will be provided several weeks prior to the exam.

**How can I get help with course material?**

**Office Hours:** These are an ideal time to come and discuss material from the course. These will be open times where we can work on any standards that you are having difficulty with. My office hours are open work times with multiple students in the space working on genetics - you can just walk in, no need to wait out side. If you want a more private conversation, we can schedule another time to meet one-on-one.

- **Tuesday: 11:30-1:00, Friday: 9 - 10:30, and by appointment**

**Discussion Board:** I have created an online discussion board on OAKS for you to post questions at anytime. Asking questions does not have to wait until office hours or after class. Post a question and I'll respond within 12 hours.
How can I be successful in Genetics?

I want you to be successful in this course. My job is to help you learn and develop a deep understanding of the course material. I am on your side! Please feel free to come speak with me at any time about the course and your work in it.

I expect that you will be actively engaged in your learning. In order to learn genetics, you have to do genetics. In BIOL 305 you will be expected to work actively, and contribute to others’ work.

Attend Class: You can’t fully understand and work toward the completion of the course standards without being an active part of our community in class each day. When in class, be engaged and active in your learning.

Before Class

- Textbook Reading
- End of Chapter Comprehension Questions

During Class

- Mini-Lecture
- In-Class Problem Solving

After Class

- Review Material
- Practice Problems
- Problem Sets
- Office Hours

Preparation before class is essential for success. If you do not prepare for class, you will not be able to participate in the in-class work and therefore you will not have the foundation for doing other work in the class. Stay on top of your readings before class. Work and take it seriously.

Be engaged and active in your learning after class. Come to office hours, make appointments, or send an email when you get stuck on a problem or have a questions about something. Set aside 2-3 hours after each course meeting to review your notes, our in-class problems, and to do the suggested practice problems from the text. This is the time to identify your areas of difficulty.

Adopt a growth mindset. According to Carol Dweck, the psychologist who coined this term, those with a “fixed mindset” believe their basic qualities such as intelligence or mathematical skill are fixed quantities. On the other hand those with a “growth mindset” believe that these basic qualities can be improved through dedication and hard work, and when they fail at something, they take it as a learning opportunity and get better by learning from their mistakes.
Our Classroom Community Strives to be Fully Inclusive

Veterans and Active Duty Military: Veterans and active duty military personnel with special circumstances (e.g., upcoming deployments, drill requirements, disabilities) are welcome and encouraged to communicate these, in advance if possible, to the instructor.

Preferred Name and Pronoun Information: I will gladly honor your request to address you by the name and gender pronouns of your choice - mine are he/him/his. Please advise me of this early in the semester via your college-issued email account or during office hours so that I may make the appropriate notation on my class list.

This course will provide equal access.

- I am happy to work with all students to ensure that they have equal access to the educational experience of this class. Any student eligible for and needing accommodations because of a disability is requested to speak with me during the first two weeks of class or as soon as you have been approved for services so that reasonable accommodations can be arranged.

- The College will make reasonable accommodations for persons with documented disabilities. Students should apply for services at the Center for Disability Services/SNAP located on the first floor of the Lightsey Center, Suite 104 (http://disabilityservices.cofc.edu/for-faculty/faqs.php). Students approved for accommodations are responsible for notifying me as soon as possible and for contacting me one week before accommodation is needed.

- This College abides by section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act. If you have a documented disability that may have some impact on your work in this class and for which you may require accommodations, please see an administrator at the Center of Disability Services/SNAP, 843-953-1431 or me so that such accommodation may be arranged.

How does the Honor Code apply to this course?

- Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students.

- A student found responsible by the Honor Board for academic dishonesty will receive a XXF in the course, indicating failure of the course due to academic dishonesty. This grade will appear on the student’s transcript for two years after which the student may petition for the XX to be expunged. The F is permanent. The student may also be placed on disciplinary probation, suspended (temporary removal) or expelled (permanent removal) from the College by the Honor Board.

- Students should be aware that unauthorized collaboration--working together without permission-- is a form of cheating. Unless the instructor specifies that students can work together on an assignment, quiz and/or test, no collaboration during the completion of the assignment is permitted.

- Students can find the complete Honor Code and all related processes in the Student Handbook.
Grading Philosophy and Re-Assessment Policy

I will use a standards-based assessment format instead of the traditional percentage-based system you’ve seen before. It is my hope that this style of assessment will give you a clearer picture on the expectations of our course, how well you have mastered the course material, and how you can improve your understanding (and your grade!).

The two key ideas of standards-based assessment are:

1. You will not receive partial credit for partially correct/complete answers; but
2. You will be given many opportunities to improve your score.

Each test problem is mapped to a specific associated standard for this genetics course. Each “standard” is a statement describing an idea or skill associated with the field of genetics. Each problem on an exam will have ten components associated with completion of the problem - you will need to complete 9 of 10 of these components to demonstrate completion of this standard. The standards you complete will be recorded in our OAKs grade book.

Policy of Re-Assessment

At any point, if you would like to improve your grade, you are invited and encouraged to take a re-assessment quiz. These will be available online and you will be given access once you have requested to take the quiz for a particular standard. After you complete your re-assessment quiz, your grade will be updated to reflect your performance on the re-assessment.

You can ask for a re-assessment for any standard as many times as you want, subject to the limitation that you may only re-attempt one standard per week starting on Monday, September 9th. If you require multiple attempts on a particular standard, I might ask you to work on some additional problems first (potentially with my help) so that we can clear up any knowledge gaps more quickly.

Note: Keep in mind that our semester, after the first exam, has about 12 weeks, but our course will have 24 standards altogether. You will also have the chance to reassess exam 4 standards on the final exam. This means that you won’t have time to re-assess every standard you encounter -- hence it will be important to demonstrate mastery of some of the material on in-class tests. In general, if you require a reassessment quiz to complete standards, then you will achieve a C in course.

This policy is designed for several purposes.

- First, if you’re ever unhappy about your grade in the course, this policy allows you to improve your course grade as your understanding of the material grows. Your grade can recover from setbacks early in the semester.
- Second, this policy gives you an incentive to learn and to master as much of the course material as you can, even if it means reviewing “old” ideas or concepts. If you’re finding a particular skill or idea tricky, you can keep working at it and re-try it as many times as you need (subject to the limitations given above).
- You can use re-assessments to earn points, even after you’ve been tested on that material. For this system to function well, you’ll need to track how you’re doing, where you can show improvement, and you’ll need self-motivation to keep trying even when you feel really stuck.

The downside of this style of assessment is that it can be hard to see how you’re doing in the class as a whole. If you have questions about your current standing, or want help understanding what you’ve mastered and where you can improve, please contact me.
Course Grade Computation and Midterm Grade Computation

To determine your course grade, I will consider your completion of the genetics standards, your average on the problem sets, your submission of genetics abstracts, and the final exam. I will use the table below to assign a letter grade. To earn each letter grade, you must achieve ALL the associated levels in all four categories for that row. Your course grade will reflect the highest grade that you qualify for. “Plus and minus” grades (like C- or B+) will be based on proximity to full letter grade.

<table>
<thead>
<tr>
<th>Semester Grade</th>
<th>Genetics Standards</th>
<th>Genetics Problem Sets (Average)</th>
<th>Genetics Abstracts</th>
<th>Final Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>≥ 21</td>
<td>≥ 85%</td>
<td>≥ 8 submissions</td>
<td>≥ 85%</td>
</tr>
<tr>
<td>B</td>
<td>≥ 18</td>
<td>≥ 80%</td>
<td>≥ 6 submissions</td>
<td>≥ 80%</td>
</tr>
<tr>
<td>C</td>
<td>≥ 15</td>
<td>≥ 70%</td>
<td>≥ 4 submissions</td>
<td>≥ 70%</td>
</tr>
<tr>
<td>D</td>
<td>≥ 12</td>
<td>≥ 60%</td>
<td>≥ 2 submissions</td>
<td>≥ 60%</td>
</tr>
<tr>
<td>F</td>
<td>&lt; 12</td>
<td>&lt; 60%</td>
<td>≥ 0 submissions</td>
<td>&lt; 60%</td>
</tr>
</tbody>
</table>

Midterm Grade Computation

Midterm grades are due on Wednesday, October 16th. At this point in the semester, you will have completed two exams (~12 standards), four problem sets, and had 7 opportunities to submit abstracts.

I will use the table below to assign a midterm letter grade. To earn each midterm letter grade, you must achieve ALL the associated levels in all categories for that row. Your midterm grade will reflect the highest grade that you qualify for. “Plus and minus” grades (like C- or B+) will be based on proximity to full letter grade.

<table>
<thead>
<tr>
<th>Midterm Letter Grade</th>
<th>Genetics Standards</th>
<th>Genetics Problem Sets (Average)</th>
<th>Genetics Abstracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>≥ 10</td>
<td>≥ 85%</td>
<td>≥ 2 submissions</td>
</tr>
<tr>
<td>B</td>
<td>≥ 9</td>
<td>≥ 80%</td>
<td>≥ 2 submissions</td>
</tr>
<tr>
<td>C</td>
<td>≥ 7</td>
<td>≥ 70%</td>
<td>1 submission</td>
</tr>
<tr>
<td>D</td>
<td>≥ 6</td>
<td>≥ 60%</td>
<td>0 submissions</td>
</tr>
<tr>
<td>F</td>
<td>&lt; 6</td>
<td>&lt; 60%</td>
<td>0 submissions</td>
</tr>
</tbody>
</table>

For a re-assessment to count toward your midterm grade, it must be completed before Wednesday, October 9th.