Note that there are 1 other lab section on Thursday taught by Dr. Richard Southgate. The experiment schedule is very similar. If you miss a lab, try to make it up that same week using one of the other sections.

Course description:
An introduction to the principles of heredity using common experimental organisms. Recent techniques in molecular genetics are also covered. Laboratory three hours per week.
Prerequisites: BIOL 111/111L, BIOL 112/112L.
Co-requisites or prerequisites: BIOL 211 and 211D, BIOL 305, MATH 250 or equivalent course in statistics or permission of instructor
**Learning Outcomes**
Students will

- Demonstrate the ability to analyze data obtained from crosses. Apply basic statistical tools to genetics data.
- Understand Mendelian Genetics and common deviations, such as epistasis, penetrance and complex traits
- Demonstrate an understanding of the critical genetic concepts of mutations, alleles, and gene interaction in genotype-phenotype interpretation
- Demonstrate an understanding of some basic molecular genetic techniques.
- Exhibit proficiency for developing hypotheses and interpreting results on the basis of hypotheses.
- Format, analyze, and communicate experimental results.
- Recognize some of the inferences of modern genetics to society in general.

**Name and pronoun statement**
I will gladly honor your request to address you by the name and gender pronouns of your choice. 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.

**Textbook**
None. Protocols and other information will be provided in class or posted on OAKS.

**Important dates**
Experiments schedule and due dates for lab reports are posted on the Excel schedule file on OAKS.

**Planned experiments**
1. Allelic series, dominance, and molecular basis of phenotype in *Drosophila*
2. Understanding gene structure and mutation types
3. DNA Polymorphism:
4. Penetrance and expressivity in *Drosophila*, and the role of modifier genes
5. Complex traits and gene mapping in dogs

We will also do multiple bioinformatics exercises throughout the semester. Please bring laptop/tablet every lab.

Please check the announcements on OAKS. As all experiments last more than a lab period, each lab section will usually deal with 2-3 different experiments. Detailed experiment schedule is provided on OAKS as an Excel file.
<table>
<thead>
<tr>
<th>week</th>
<th>Experiment</th>
<th>Classwork/report</th>
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</thead>
<tbody>
<tr>
<td>8/23-24</td>
<td>No lab: review safety information online</td>
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<tr>
<td>8/30-31</td>
<td>What is a gene? discussion NCBI exercise. Gene/cDNA exercise, Translate, BLAST, etc</td>
<td>Classwork end of lab</td>
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<tr>
<td>9/06-07</td>
<td>Drosophila familiarization, life cycle Transfer and flynap, Sexing, food preparation, Recognize and document phenotypes White F1 cross set up</td>
<td>Evaluation of quality of cross set up: food amount and consistency, live flies, labelling of vials</td>
</tr>
<tr>
<td>9/13-14</td>
<td>Mutations introduction Arabidopsis mutant classwork HHMI stickleback mutant classwork</td>
<td>Classwork end of lab</td>
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<tr>
<td>9/20-21</td>
<td>White allelic series White protein exercise White F1 data White wrap-up discussion</td>
<td>REPORT 1 (white) due next week</td>
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<td>Pipetting and setting up reaction exercises</td>
<td>Evaluation of accuracy</td>
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<tr>
<td>9/27-28</td>
<td>DNA polymorphisms: intro on VNTR Exercises on VNTR, identity testing PCR intro Exercises on PCR primer and size</td>
<td>Classwork end of lab</td>
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<tr>
<td></td>
<td>Dog DNA extraction</td>
<td>Evaluation: Ability to follow protocol, complete extraction in a timely manner and without mistakes</td>
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<tr>
<td>10/04-05</td>
<td>Midterm exam</td>
<td></td>
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<tr>
<td></td>
<td>DNA polymorphisms: CNV Introduction to qPCR and amylase experiment</td>
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<tr>
<td>Date</td>
<td>Activity</td>
<td>Notes</td>
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<tr>
<td>10/11-12</td>
<td>Amylase qPCR set up&lt;br&gt; DNA polymorphisms: intro on SNP and RFLP&lt;br&gt; Exercises on RFLP / using PTC data</td>
<td>Evaluation of correct set up (DNA-primer match), correct labelling of tubes and accuracy Classwork due at end of lab</td>
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<tr>
<td></td>
<td>Transfer Lobe F1 to F2 cross</td>
<td>Evaluation of quality of cross set up: food amount and consistency, live flies, labelling of vials</td>
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<tr>
<td>10/18-19</td>
<td>CNV amylase data discussion&lt;br&gt; Dog complex traits mapping: introduction&lt;br&gt; Dog card exercise&lt;br&gt; Dog PCR set up</td>
<td>REPORT 2 (CNV) due next week Classwork due at the end of class Evaluation of correct set up (DNA-primer match), correct labelling of tubes and accuracy</td>
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<tr>
<td>10/25-26</td>
<td>Dog gel electrophoresis&lt;br&gt; Data collection for Lobe P, F1 and F2&lt;br&gt; Lobe class discussion</td>
<td>REPORT 3 (Lobe) due next week</td>
</tr>
<tr>
<td>11/01-02</td>
<td>Discussion dog data&lt;br&gt; Linkage exercise&lt;br&gt; Mapping</td>
<td>REPORT 4 (dog) due next week Classwork at the end of lab</td>
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<tr>
<td>11/08</td>
<td>Fall Break</td>
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<tr>
<td>11/09</td>
<td>FISH chromosome aberrations</td>
<td>Classwork at the end of lab</td>
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<tr>
<td>11/15-16</td>
<td>TBA, Coral? Practical ??</td>
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<tr>
<td>11/22</td>
<td>FISH chromosome aberrations</td>
<td>Classwork at the end of lab</td>
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<tr>
<td>11/23-27</td>
<td>Thanksgiving</td>
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<tr>
<td>11/29-30</td>
<td>Final exam</td>
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</table>
Evaluation and grading:
35% Team Lab reports: work on the reports as a team and submit 1 report/team.
35% Team lab exercises work on the exercises as a team and submit 1 report/team.
10% mid-term exam: individual
20% Final exam and practical: individual

Grading scale:
92 and above: A
90-91.9: A-
87-89.9: B+
83-86.9: B
80-82.9: B-
77-79.9: C+
74-76.9: C
70-73.9: C-
67-69.9: D+
64-66.9: D
60-63.9: D-
below 60: F

COURSE POLICIES

• Lab Safety:
The official SSM lab safety policy document is posted on OAKS and needs to be reviewed. A lab safety quiz will be given in lab (9/01-02) and need to be PASSED before you are allowed to work in the lab. Observance of all safety regulations is expected, in particular dress code and food/beverage rules. There will be NO EXCEPTIONS. Failure to follow the safety guidelines will debar you from performing the experiment on the given day and you will not receive any grades for the same. Repeated offenses will lead to withdrawal from the course.

• Attendance.
You are expected to do your share of the work. Many of the labs involve long period of time at the microscope, and it's unfair to expect your lab partner to do all the work if you miss a lab. If you're sick, please send me and your partner an e-mail so that arrangements can be made. Most of the investigations may be impossible to make up. There is a possibility of a make-up only if you can make arrangements with your partner and get yourself scheduled into one of the other sections of the BIOL 305L within the same week. Accommodations will be granted in case of close contact to someone positive for COVID, quarantine, and of course if you are COVID positive. Let me know as soon as possible. Other serious medical emergencies also qualify.
• Excessive absence
Missing 2 laboratories without valid excuse will result in a midterm F, which can still be changed to a regular final grade. This policy does not apply if the absences are due to a SERIOUS medical or personal reason and verification is provided.

• Electronic devices
You are encouraged to bring your laptop or tablet for every class, but they can only be used for class activities. Breach of that trust will lead to you losing that right and therefore the ability to perform certain experiments.

• Lab reports
Instructions for lab reports are available on OAKS. There will be questions to answer and analyses to perform for each investigation. Reports are team-based. You must work closely with your partner to gather and analyze the data, which should be clearly presented, legible, and neat. The stepwise calculations done to obtain the results should be shown, as you will be graded accordingly. Images have to be processed properly (cropped, labelled, etc.) to reflect and focus on the data. Failure to do so will result in lost points. Reports should be posted in the correct Dropbox on OAKS on the week listed in the experiment schedule file. You have a week-long "grace period" in which you could submit your report for half credit, but reports will not be accepted thereafter, except for extenuating circumstances.

COLLEGE POLICIES
• Weather-related closures
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. Keep storm days (labeled as SD in Registrar calendar) free of any engagement (work, travel, etc.) in case they need to be used for making up canceled lab periods.

• Disability Services
1. Any student eligible for and needing accommodations because of a disability is requested to speak with the professor during the first two weeks of class or as soon as the student has been approved for services so that reasonable accommodations can be arranged.
2. 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. Students approved for accommodations are responsible for notifying me as soon as possible and for contacting me one week before the accommodation is needed.

3. 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.

- **Honor code and academic integrity**

  Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when identified, are investigated. Each incident will be examined to determine the degree of deception involved. Incidents where the instructor determines the student’s actions are related more to a misunderstanding will handled by the instructor. A written intervention designed to help prevent the student from repeating the error will be given to the student. The intervention, submitted by form and signed both by the instructor and the student, will be forwarded to the Dean of Students and placed in the student’s file.

  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 an 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. Other forms of cheating include possessing or using an unauthorized study aid (which could include accessing information via a cell phone or computer), copying from others’ exams, fabricating data, and giving unauthorized assistance.

  Research conducted and/or papers written for other classes cannot be used in whole or in part for any assignment in this class without obtaining prior permission from the instructor.

  Students can find the complete Honor Code and all related processes in the *Student Handbook* at [http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php](http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php)
• **Center for Student Learning:**
The Center for Student Learning’s (CSL) academic support services provide assistance in study strategies, speaking & writing skills, and course content. Services include tutoring, Supplemental Instruction, study skills appointments, and workshops. Students of all abilities have become more successful using these programs throughout their academic career and the services are available to you at no additional cost. For more information regarding these services please visit the CSL website at http://csl.cofc.edu or call (843) 953-5635.

• **Mental & Physical Wellbeing:**
At the college, we take every students’ mental and physical wellbeing seriously. If you find yourself experiencing physical illnesses, please reach out to student health services (843.953.5520). And if you find yourself experiencing any mental health challenges (for example, anxiety, depression, stressful life events, sleep deprivation, and/or loneliness/homesickness), please consider contacting either the Counseling Center (professional counselors at http://counseling.cofc.edu or 843.953.5640 3rd Robert Scott Small Building) or the Students 4 Support (certified volunteers through texting "4support" to 839863, visit http://counseling.cofc.edu/cct/index.php, or meet with them in person 3rd Floor Stern Center). These services are there for you to help you cope with difficulties you may be experiencing and to maintain optimal physical and mental health.

• **Inclusion:**
The College of Charleston offers many resources for LGBTQ+ students, faculty and staff along with their allies.
  - On Campus Gender Inclusive facilities
  - Campus Resources
  - College of Charleston Reporting Portals
  - National Resources for Faculty & Staff
  - GSEC Reports
  - Documenting LGBTQ Life in the Lowcountry (CofC Addlestone Library Special Collections Project)
  - College of Charleston Quality Enhancement Plan (QEP)
  - Articles about CofC and LGBTQ+ Issues

• **Statement on “Religious Accommodation for Students”**
The College of Charleston community is enriched by students of many faiths that have various religious observances, practices, and beliefs. We value student rights and freedoms, including the right of each student to adhere to individual systems of religion. The College prohibits discrimination against any student because of such student’s religious belief or any absence thereof.
The College acknowledges that religious practices differ from tradition to tradition and that the demands of religious observances in some traditions may cause conflicts with student schedules. In affirming this diversity, like many other colleges and universities, the College supports the concept of “reasonable accommodation for religious observance” in regard to class attendance, and the scheduling of examinations and other academic work requirements, unless the accommodation would create an undue hardship on the College. Faculty are required, as part of their responsibility to students and the College, to ascribe to this policy and to ensure its fair and full implementation.

The accommodation request imposes responsibilities and obligations on both the individual requesting the accommodation and the College. Faculty members are expected to reasonably accommodate individual religious practices. Examples of reasonable accommodations for student absences might include rescheduling of an exam or giving a make-up exam for the student in question; altering the time of a student’s presentation; allowing extra-credit assignments to substitute for missed class work or arranging for an increased flexibility in assignment dates. Regardless of any accommodation that may be granted, students are responsible for satisfying all academic objectives, requirements and prerequisites as defined by the instructor and by the College.

**Food & Housing Resources:**
Many CofC students report experiencing food and housing insecurity. If you are facing challenges in securing food (such as not being able to afford groceries or get sufficient food to eat every day) and housing (such as lacking a safe and stable place to live), please contact the Dean of Students for support (http://studentaffairs.cofc.edu/about/salt.php). Also, you can go to http://studentaffairs.cofc.edu/student-food-housing-insecurity/index.php to learn about food and housing assistance that is available to you. In addition, there are several resources on and off campus to help. You can visit the Cougar Pantry in the Stern Center (2nd floor), a student-run food pantry that provides dry-goods and hygiene products at no charge to any student in need. Please also consider reaching out to Professor ABC if you are comfortable in doing so.