BIOL 305L-03 Genetics Lab
Spring 2016 Syllabus
Tuesdays 4:30-7:30 pm
SSMB 141

Instructor: Dr. Melissa Scheiber
Office: SSMB 212
Office Hours: By Appointment
Phone: 843-953-9530
Email: scheibermn@cofc.edu

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.

Learning Outcomes

Students will
- Demonstrate the ability to use and explain Mendelian Genetics, as well as modern molecular genetic techniques.
- Demonstrate an understanding of developing hypotheses and interpreting results on the basis of their hypothesis.
- Analyze, communicate, and discuss experimental results.
- Understanding some of the implications of modern genetics to society.

Text book
None.
Protocols will be provided in class or posted on OAKS.

Course policies

1. The Genetics Laboratory (SSMB 141) is open essentially every day during regular business hours.

2. Attendance. You are expected to do your share of the work. Many of the labs can get tedious, and it’s unfair to expect your lab partner to do all the work if you miss a lab. So 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 another section of the BIOL 305L within the same week.

EXCESSIVE ABSENCE, i.e. MISSING 2-3 LABS WILL RESULT IN A “WA” GRADE (WITHDRAWN EXCESSIVE ABSENCE) AT MIDTERM AND/OR FINAL GRADE. AT MIDTERM WA CAN STILL BE CHANGED TO A REGULAR FINAL GRADE. A FINAL "WA" GRADE IS CALCULATED AS AN "F" IN YOUR GPA.
3. **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.

4. **Lab reports** are variably-formatted. There will be questions to answer and analyses to perform for each investigation. You must work closely with your partner to gather the data for most lab reports, but please think and write independently. Everyone should submit his/her own lab report with his/her own data analysis. The data in your lab report should be clear, legible and neat. The step wise calculations done to obtain the results should be shown, as you will be graded accordingly. Reports are due either at the end of lab on a week after completion of the investigation or on the announced week. Lab reports not submitted promptly at the start/end of class are late, and will be marked off 50%. You have a week-long "grace period" in which you could submit your report for half credit, but reports will not be accepted thereafter.

5. **Lab Cleanliness:** It is as important to clean the lab after your experiment by putting away the materials used in the right place, cleaning your culture bottles/apparatus used and keeping the area tidy. Failure to do so will be reflected in the grades for that experiment.

**College Policies**

- **Lab Safety:** A list of safety policy and procedures will be distributed in the first class and an acknowledgement of receipt of the same will be obtained. Observance of all safety regulations is expected. It is expected that these procedures be followed while coming to lab. **Failure to follow the safety guidelines may debar you from performing the experiment on the given day and you will not receive any grades for the same.**

- **Disability Services**
The College will make reasonable accommodations for persons with documented disabilities. Students should apply at the Center for Disability Services / SNAP, located on the first floor of the Lightsey Center, Suite 104. If there is a student in the class who has a documented disability and has been approved to receive accommodations through the Center for Disability Services / SNAP, please come and discuss this with me during my office hours.

- **Honor code and academic integrity**
Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when identified, are investigated. Each instance is examined to determine the degree of deception involved.

Incidents where the professor believes the student’s actions are clearly related more to ignorance, miscommunication, or uncertainty, can be addressed by consultation with the student. We will craft a written resolution designed to help prevent the student from repeating the error in the future. The resolution, submitted by form and signed by both the professor and the student, is forwarded to the Dean of Students and remains on file.

Cases of suspected academic dishonesty will be reported directly to the Dean of Students. A student found responsible for academic dishonesty will receive a XF 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 X to be expunged. The student may also be placed on disciplinary probation, suspended (temporary removal) or expelled (permanent removal) from the College by the Honor Board.
It is important for students to remember that unauthorized collaboration—working together without permission—is a form of cheating. Unless a professor specifies that students can work together on an assignment and/or test, no collaboration is permitted. Other forms of cheating include possessing or using an unauthorized study aid (such as a PDA), copying from another’s exam, fabricating data, and giving unauthorized assistance.

Remember, 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 professor.

Students can find a complete version of the Honor Code and all related processes in the Student Handbook at http://www.cofc.edu/studentaffairs/general_info/studenthandbook.html.

**Course grading**

<table>
<thead>
<tr>
<th>LAB REPORT</th>
<th>Due Date</th>
<th>POINTS</th>
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<tbody>
<tr>
<td>1. Probability and Statistics</td>
<td></td>
<td>8</td>
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<tr>
<td>2. Drosophila Familiarization</td>
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<td>5</td>
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<td>3. Dihybrid crosses in corn</td>
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<td>8</td>
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<tr>
<td>4a. Variable expressivity</td>
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<td>6</td>
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<td>4b. Incomplete Penetrance</td>
<td>March 1</td>
<td>6</td>
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<tr>
<td>5. Mutagenesis</td>
<td>March 22</td>
<td>12</td>
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<td>6. PTC</td>
<td>March 29</td>
<td>15</td>
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<td>7. Polymorphic loci</td>
<td>April 5</td>
<td>15</td>
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<td>8. Bioinformatics</td>
<td>April 12</td>
<td>15</td>
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<td>9. Selection and Drift</td>
<td>April 19</td>
<td>10</td>
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<tr>
<td><strong>TOTAL for Lab reports</strong></td>
<td>April 19</td>
<td>100</td>
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<tr>
<td>FINAL Presentation</td>
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<td>20</td>
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<td>Lab Performance</td>
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<td><strong>COURSE TOTAL</strong></td>
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<td>130</td>
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**GRADE 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
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic &amp; Exercise</th>
<th>Investigations</th>
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<tbody>
<tr>
<td>Jan 12</td>
<td>Introduction</td>
<td></td>
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<tr>
<td>Jan 19</td>
<td>Probability &amp; Statistics</td>
<td>Inv. 1</td>
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<tr>
<td>Jan 27</td>
<td>&quot;Drosophila&quot; familiarization&lt;br&gt;Set up two experiments with the &quot;Lobed&quot; gene:&lt;br&gt;- A comparison of variation in expressivity due to genetics and environment (&quot;expressivity&quot;)&lt;br&gt;- Incomplete penetrance in a monohybrid cross (&quot;penetrance&quot;)</td>
<td>Inv. 3&lt;br&gt;Inv. 4</td>
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<td>Feb 2</td>
<td>Independent assortment and gene interaction in maize&lt;br&gt;Set up selection &amp; drift experiments (&quot;S&amp;D&quot;)&lt;br&gt;Clear penetrance &amp; expressivity experiments</td>
<td>Inv. 2&lt;br&gt;Inv. 5</td>
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<td>Feb 9</td>
<td>Set up trihybrid cross for gene mapping experiment (&quot;THC&quot;)&lt;br&gt;Analysis of variable expressivity&lt;br&gt;Clear S&amp;D experiments</td>
<td>Inv. 6&lt;br&gt;Inv. 4</td>
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<td>Feb 16</td>
<td>Count &amp; transfer F1 from S&amp;D experiments&lt;br&gt;Clear penetrance experiment&lt;br&gt;Clear parentals from THC</td>
<td>Inv. 5</td>
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<tr>
<td>Feb 23</td>
<td>Analysis of incomplete penetrance in a monohybrid cross&lt;br&gt;Clear S&amp;D experiment&lt;br&gt;Discard THC</td>
<td>Inv. 4</td>
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<td>Mar 1</td>
<td>Count and transfer F2 from S&amp;D experiment&lt;br&gt;Mutagenesis Ames test set up (bring in mutagen to test)</td>
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<td>Mar 8</td>
<td>Spring Break&lt;br&gt;Instructor will clear S&amp;D, as well as place AMES plates at 4 degrees</td>
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<td>Mar 15</td>
<td>Count and transfer F3 from S&amp;D experiment&lt;br&gt;Mutagenesis Ames test results and discussion</td>
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<tr>
<td>Mar 22</td>
<td>Clear S&amp;D experiment&lt;br&gt;Human genetics 1: PTC test&lt;br&gt;DNA preparation and PCR for PTC</td>
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<tr>
<td>Mar 29</td>
<td>Count F4 and terminate S&amp;D experiment&lt;br&gt;Human genetics 1: PTC part II: gel electrophoresis and analysis&lt;br&gt;Human genetics 2: PCR for polymorphic loci</td>
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<tr>
<td>April 5</td>
<td>Human genetics 2: polymorphic loci: gel electrophoresis and analysis&lt;br&gt;Basic bioinformatics</td>
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<tr>
<td>April 12</td>
<td>Human genetics: wrap up discussion, pro/con of genetic testing</td>
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<tr>
<td>April 19</td>
<td>Presentations</td>
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SAFETY POLICY AND PROCEDURES

The School of Sciences and Mathematics of the College of Charleston understands that the safety of our students, staff and faculty is of paramount importance. Engendering a safety culture is an important part of our mission in teaching and doing science. Each department, course of instruction, or research lab may require higher standards or procedures. The policies and procedures set forth below are understood to be minimum requirements across our departments.

In this document, the term "laboratory" is meant for a work space/facility where chemicals, biological agents, or equipment is used for research and/or instruction.

No one (student, staff, faculty, or visitor) will be allowed in a laboratory (teaching or research) to perform experiments or where experiments may be in progress unless these regulations are followed.

Students dismissed from a teaching lab due to violations of the safety procedures will not be allowed to re-enter the laboratory until authorized to do so by their supervisor (instructor) and, in the case of research laboratories, by the department chair or designee. Any course work missed because of a violation of these guidelines cannot be made up at another time (or by an extension of the lab period) and will be treated as an unexcused absence.

1. You are responsible for knowing the biological, chemical, electrical, ergonomic, mechanical, and physical hazards associated with the equipment and materials that are being utilized in the laboratory. Listen to all instructions and ask questions about that which you do not understand.

2. Know the location of safety equipment: telephones, emergency shower, eyewash, fire extinguisher, fire alarm pull.

3. Know the appropriate emergency response procedures. If there is an injury or emergency, call 953-5611.

4. Do not work alone in the laboratory if you are working with hazardous materials or equipment.

5. Use hazardous chemicals, equipment, and biological agents only as directed and for their intended purpose.

6. Do not engage in horseplay, pranks or other acts of mischief while in lab.

7. Drinking, eating, and application of cosmetics is forbidden in laboratories where chemicals or biohazards are present. Smoking is forbidden in all College buildings.

8. Appropriate personal protective equipment shall be worn. The dress code for laboratory work when using chemicals, biological or physical hazards, or when instructed to do so by the laboratory supervisor is as follows:
   a) Wear safety glasses or goggles at all times. b) No exposed skin on arms, legs or torso.
   c) Wear lab coats or other approved protective garments.
   d) Wear gloves or other personal protective equipment (PPE) as directed by the instructor or mandated by prudent practices based on the chemicals being handled. If in doubt, wear appropriate gloves. Latex is not permitted. Avoid cross-contamination.
   e) Remove PPE (gloves and lab coat) when exiting the laboratory.
   f) Wash your hands, even if gloves were used, before leaving a lab where you did any lab work.
g) Closed toe shoes are required. The heel and top of foot must be covered. High heeled shoes, sandals, and perforated shoes are not permitted.
h) Confin[e long hair and loose clothing.

9. Inspect equipment or apparatus for damage before adding chemical reagents or biological samples or energizing electrical equipment. Do not use damaged equipment.

10. Never remove chemicals, biological samples, or laboratory equipment from a lab without proper authorization.

11. Presume that all chemicals and biological samples used in the laboratory are hazardous for you and the environment, unless instructed otherwise.

12. Never leave an experiment unattended unless proper safety precautions are in place.

13. Read all labels on chemicals twice before using them in the lab. Read all instructions twice for the operation of any equipment or machinery.

14. Properly and safely dispose of all waste materials.

15. Treat sharps and broken glassware containers carefully.
a) Broken glass should be disposed of in properly marked safety containers. All sharps (needles, razor blades, etc.) used for any purpose must be disposed of in specially labeled SHARPS containers.
b) Do not place contaminated glass in the broken glassware container. Consult your supervisor. c) Waste chemicals and contaminated PPE should be discarded as directed.

16. When using a reagent, replace the lid immediately. Never return unused reagents to stock bottles. Take only the amount needed for your experiment.

17. All chemicals and biological samples/media are to be disposed of in appropriately labeled containers. Specific instructions for each material will be provided. Pay attention to waste container labels before adding the material to be discarded.

18. Use good personal hygiene. Keep your hands and face clean. Wash hands thoroughly with soap and water after handling any chemical or biological agent.

19. Keep the work area clean and uncluttered with chemicals and equipment. Clean up the work area on completion of an operation or an experiment. Before leaving the laboratory, you are responsible for making sure your lab area is clean and organized.

20. Never store a chemical or biological specimen in an unlabeled container.

20. Always have your College of Charleston identification and insurance information with you when working in a laboratory. MedicAlert identification must be worn if you have any potential life-threatening chemical sensitivities or medical conditions.

21. Report any accident or injury, however minor, to your teaching assistant, instructor, or lab supervisor immediately. An accident report form must be completed and forwarded to the department chair, dean, and to the Director of Environmental Health and Safety.

If you have questions/concerns about safety in the lab please first consult your instructor. If these are not answered, please see the department chair. Finally, you may consult the director of Environmental Health and Safety, Randy Beaver at 3-6802 or beaverr@cofc.edu

Adopted: March 7, 2012
CougarAlert

The College of Charleston has an agreement with the Blackboard Connect Inc. (formerly The NTI Group, Inc. (NTI)) to use its Connect-ED communication software to provide an emergency notification system that is capable of reaching students, faculty, staff and parents within minutes of a campus crisis. This system is called CougarAlert.

Information for Students

The CougarAlert emergency notification system will contact up to six phone numbers for the student. Students may include family member numbers in their address and phone number information.

All students should log onto MyCharleston to review their address and telephone information and update as needed.

To access the address and telephone information, follow these steps:
1. Log on to MyCharleston
2. Click on the Academic Services tab
3. Click on the Banner Self-Service link in the third column
4. Click on the Personal Information link
5. Click on the Update Address and Phones and Cougar Alert link

The CougarAlert system will pull the phone number in the following order – cell, phone with text messaging option, cell phone without text messaging option, residence hall room phone number, mailing phone number, home phone number, parent phone number, and parent 2 phone number.

If you do not have all of these numbers in your student record, the system will select the next number on the list.

To avoid issues related to timely communication of emergency messages to the proper places, every student must update his or her contact information in MyCharleston with current accurate information.

CougarAlert Display Information

When you receive an emergency message from the College of Charleston’s CougarAlert System, the return e-mail address will be displayed as cougaralert@cofsc.edu, and Caller ID will be displayed as 843.725.7246 (this is the College’s Emergency Information Hotline).

Testing and Implementation

Testing will be conducted each semester to verify all systems are operating properly. The campus community will be notified via e-mail and web page postings when testing of the system will be conducted.

Blackboard Connect Software

Blackboard Connect is an emergency communication software that sends notification before, during and after an emergency. With this new system, the College will be able to communicate in many modes, including voice messages to home, work and cell phones; text messages to cell phones, PDAs and other devices; written messages to e-mail accounts; and messages to teletypewriters and telecommunication devices (TTY/TDD) for the hearing impaired. In combination with our existing communications methods and emergency response plans, this new notification system will significantly enhance the College of Charleston’s ability to maintain a learning environment in which students are safe, secure and comfortable.

In an emergency, communications to the campus will be issued in the following priority order:
1. Message to the Blackboard Connect Emergency Notification System (phone and e-mail).
2. Recorded message to the College’s Emergency Information Hotline, 843.725.7246.
3. Update to the Website.
4. Printed update sheets to be distributed and posted on campus (if necessary).

The CougarAlert system will only be used to notify you in the event of a campus crisis or emergency.