Genetics Lab 305L Course Policy, Spring 2016

Four Sections – Monday L01, Tuesday afternoon L02, Tuesday evening L03, Wednesday L04.

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1. Catalog Description – An introduction to the principles of heredity using common experimental organisms. Recent techniques in molecular genetics are also covered. Biology 211 and 211D (Biodiversity) is a prerequisite, and Genetics Lecture 305 is a pre-requisite or co-requisite. Math 250 (Statistical Methods) is a prerequisite for all 300-level biology classes.

2. Explicit Learning Outcome – "It is the business of a University to impart to the rank and file of the men whom it trains the right thought of the world, the thought which it has tested and established, the principles which have stood through the seasons and become at length part of the immemorial wisdom of the race. The object of education is not merely to draw out the powers of the individual mind: it is rather its right object to draw all minds to a proper adjustment to the physical and social world in which they are to have their life and their development: to enlighten, strengthen and make fit. The business of the world is not individual success, but its own betterment, strengthening, and growth in spiritual insight-- 'So teach us to number our days, that we may apply our hearts unto wisdom' is its right prayer and aspiration." Woodrow Wilson, 1896.

3. The Genetics Laboratory (Relocated to SSMB 141 during the renovation) is open essentially every day during regular school hours, although the labs for several other courses are sharing our same space. So if you need to work in the lab at some time other than assigned for your class, please be respectful. I will have **"office hours" in SSMB 141 on Monday & Wednesday 1 – 2:00 PM, and Tuesday 12:15 – 1:15 PM,** and will certainly be present at many other times as well, but it is always best to make an appointment.

4. Lab Manual is available from the College Bookstore. Please read the introduction and be familiar with each investigation before coming to class. You will also find it helpful to review the relevant sections of your textbook.

5. Attendance. You are expected to do your share of the work. Many of the investigations (especially the fruit fly ones) can get tedious, and it is unfair to expect your lab partner to do all the work if you miss a class. So if you're sick, please **call 953-8087 or email dillonr@cofc.edu ASAP** so arrangements can be made. Some of the investigations may be impossible to make up, although you can get the data later.

6. Lab reports are variably-formatted. There will be questions to answer and analyses to perform after each exercise. You must work closely with your lab partner to gather data for most lab reports, but **please think independently.** Everyone should submit his own report with his own data analysis. Reports are due one week after the completion of the investigation, unless noted later in this packet. Reports not submitted promptly **at the start of class** are late, and will be marked off 50%. If you are sick, send me your lab report by email or by courier. You have a week-long "grace period" in which to submit your report for half credit, but lab reports will not be accepted thereafter.

7. Practical quizzes do not consume the entire class period and are not comprehensive. Nevertheless, the same policy pertains in lab and lecture. Contact me ASAP if you must miss a quiz. Regardless of your excuse, the later the make-up, the harder the test.

8. You will need a calculator for this course. A smart phone will not suffice. No smart phones or any other device that may be connected to the internet will be allowed during quizzes.

9. Watch the Genetics Lab website for "**News, Announcements, and Reminders**" as the semester proceeds:
http://dillonr.people.cofc.edu/genelab.htm
Among the many useful resources available from the course site is a pdf download entitled, "Dr. Dillon's Teaching Philosophy."

Monday Schedule, Spring 2016

Genetics Lab 305.L01

R. T. Dillon

Investigations are from my *Genetics 305L Lab Manual*, available at the College Bookstore.
Readings are from *Genetics, A Conceptual Approach* (5e) by B. A. Pierce.

Date	Investigations and Exercises	Readings
Jan 11	Introduction	-
Jan 18	MLK Day, no classes	-
Jan 25	**Inv. 1**, Probability & Statistics	56-57, 64-66
Feb 1	**Inv. 3**, *Drosophila* familiarization **Inv. 4**, Set up two experiments with the "Lobed" gene: - A comparison of variation in expressivity due to genetics and environment ("expressivity") - Incomplete penetrance in a monohybrid cross ("penetrance")	126-127
Feb 8	**Inv. 2**, Independent assortment and gene interaction in maize **Inv. 5**, Set up selection & drift experiments ("S&D") Clear penetrance & expressivity experiments	59-62, 110-115
Feb 15	Analysis of variable expressivity **Inv. 6**, Set up trihybrid cross for gene mapping experiment ("THC") Clear S&D experiments	180-186
Feb 22	Count & transfer F1 from S&D experiments Clear penetrance experiment Clear parentals from THC	-
Feb 29	Analysis of incomplete penetrance in a monohybrid cross Make THC test cross Clear S&D experiments	-
Mar 7	**Spring Break** Instructor will clear F1 from THC	-
Mar 14	**Lab Quiz** Count & transfer F2 from S&D experiments	-
Mar 21	**Inv. 6**, Linkage analysis Clear S&D experiments	-
Mar 28	**Inv. 7**, Human cytogenetics Count & transfer F3 from S&D experiments	222-227
Apr 4	**Inv. 8**, Chromatography Clear S&D experiments	412-15
Apr 11	**Inv. 9**, Protein electrophoresis	716-23, 746-7
Apr 18	Count F4 and terminate S&D experiments Selection and genetic drift	728-732
Apr 21	(Thursday!) **Lab Quiz**	-

Tuesday Schedule, Spring 2016

Genetics Lab 305.L02 & L03

R. T. Dillon

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Readings are from *Genetics, A Conceptual Approach* (5e) by B. A. Pierce.

Date	Investigations and Exercises	Readings
Jan 12	Introduction	-
Jan 19	**Inv. 1**, Probability & Statistics	56-57, 64-66
Jan 26	**Inv. 3**, *Drosophila* familiarization **Inv. 4**, Set up two experiments with the "Lobed" gene: - A comparison of variation in expressivity due to genetics and environment ("expressivity") - Incomplete penetrance in a monohybrid cross ("penetrance")	126-127
Feb 2	**Inv. 2**, Independent assortment and gene interaction in maize **Inv. 5**, Set up selection & drift experiments ("S&D") Clear penetrance & expressivity experiments	59-62, 110-115
Feb 9	Analysis of variable expressivity **Inv. 6**, Set up trihybrid cross for gene mapping experiment ("THC") Clear S&D experiments	180-186
Feb 16	Count & transfer F1 from S&D experiments Clear penetrance experiment Clear parentals from THC	-
Feb 23	Analysis of incomplete penetrance in a monohybrid cross Make THC test cross Clear S&D experiments	-
Mar 1	**Lab Quiz** Clear F1 from THC Count & transfer F2 from S&D experiments	-
Mar 8	**Spring Break** Instructor will clear S&D experiments	-
Mar 15	Linkage analysis	-
Mar 22	**Inv. 7**, Human cytogenetics Count & transfer F3 from S&D experiments	222-227
Mar 29	**Inv. 8**, Chromatography Clear S&D experiments	412-15
Apr 5	**Inv. 9**, Protein electrophoresis	716-23, 746-7
Apr 12	Count F4 and terminate S&D experiments Selection and genetic drift	728-732
Apr 19	**Lab Quiz**	-

Wednesday Schedule, Spring 2016

Genetics Lab 305.L04

R. T. Dillon

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Readings are from *Genetics, A Conceptual Approach* (5e) by B. A. Pierce.

Date	Investigations and Exercises	Readings
Jan 13	Introduction	-
Jan 20	**Inv. 1**, Probability & Statistics	56-57, 64-66
Jan 27	**Inv. 3**, *Drosophila* familiarization **Inv. 4**, Set up two experiments with the "Lobed" gene: - A comparison of variation in expressivity due to genetics and environment ("expressivity") - Incomplete penetrance in a monohybrid cross ("penetrance")	126-127
Feb 3	**Inv. 2**, Independent assortment and gene interaction in maize **Inv. 5**, Set up selection & drift experiments ("S&D") Clear penetrance & expressivity experiments	59-62, 110-115
Feb 10	Analysis of variable expressivity **Inv. 6**, Set up trihybrid cross for gene mapping experiment ("THC") Clear S&D experiments	180-186
Feb 17	Count & transfer F1 from S&D experiments Clear penetrance experiment Clear parentals from THC	-
Feb 24	Analysis of incomplete penetrance in a monohybrid cross Make THC test cross Clear S&D experiments	-
Mar 2	**Lab Quiz** Clear F1 from THC Count & transfer F2 from S&D experiments	-
Mar 9	**Spring Break** Instructor will clear S&D experiments	-
Mar 16	Linkage analysis	-
Mar 23	**Inv. 7**, Human cytogenetics Count & transfer F3 from S&D experiments	222-227
Mar 30	**Inv. 8**, Chromatography Clear S&D experiments	412-15
Apr 6	**Inv. 9**, Protein electrophoresis	716-23, 746-7
Apr 13	Count F4 and terminate S&D experiments Selection and genetic drift	728-732
Apr 20	**Lab Quiz**	-

COURSE GRADING, Spring 2016

LAB REPORT	**Due date for** Monday.L01	**Due date for** Tuesday.L02 & L03	**Due Date for** Wednesday.L04	**POINTS**	**TOTALS**
1. Probability and Statistics	Feb 1	Jan 26	Jan 27	8	
2. *Drosophila* familiarization	Feb 1	Jan 26	Jan 27	5	
3. Dihybrid crosses in corn	Feb 15	Feb 9	Feb 10	8	
4a. Variable expressivity	Feb 22	Feb 16	Feb 17	6	
4b. Incomplete penetrance	Mar 14	Mar 1	Mar 2	8	
6. Chromosome mapping	Apr 28	Mar 22	Apr 23	12	
7. Human cytogenetics	Apr 4	Mar 29	Mar 30	12	
8. Chromatography of eye pigments	Apr 11	Apr 5	Apr 6	10	
9. Protein electrophoresis	Apr 21	Apr 19	Apr 20	12	
5. Selection and genetic drift	Apr 27	Apr 27	Apr 27	24	
TOTAL for lab reports					105
LAB EXAMS, two @ 40 pts ea.					80
Lab performance					15
COURSE TOTAL					**200**