

## **College of Arts and Sciences** Department of Biological Sciences

# BIOL 3141- Genetics Lab FALL 2022

Class 2.00pm- 4.50 222 Brown Hall Instructor – Dr. Ekaterina N. Kaverina, cell 4237411019, kaverina@etsu.edu. No office hours, just email me. We can meet by appointment if needed.

Our plan includes 2 genetic experiments on Drosophila melanogaster, 5 experiments on other materials and a session in the computer lab. A genetic experiment routinely takes more than one lab session and can last several days.

<u>Laboratory reports</u>. Four experiments will require formal lab reports which should follow standard scientific paper plan (Introduction, Materials and Methods, Results, Discussion, Conclusions). The Introduction must explain the aim of the experiment, hypotheses tested, and the importance of the task. The Methods section must explain clearly and completely what we did. The Results should present your data completely and comprehensively; no interpretation, – this is reserved for the Discussion which should also explain the meaning of your findings in connection with the general picture. Your list of references needn't be long, a few are enough. *Lab reports are to be submitted electronically on D21; due the week after the experiment has been completed*. I will allow 1 (one) resubmission with corrected mistakes. Resubmissions are generally due 1 week after my feedback. Please read my feedback!

There will be a total of 4 written <u>homework assignments</u>, on a smaller scale than a lab report, think worksheets.

Folders will be created in the d2l dropbox for all reports and homework sheets. *Electronic* 

#### submissions only!

I cannot accept late submissions.

<u>There will be no quizzes in class this year.</u> I will ask you questions after class, creating a d2l folder for you to answer them. They are checking your understanding of the concept revealed in the experiment and the approaches used - will more or less follow the "lectures" on appropriate topics. Not every time, not every time, but many class sessions will be followed by this kind of "take-home quiz". They will be more or less 10 points each, it's not set in stone and I can change it. There will be <u>no make-up for these</u>. *All tests this term are fully open – yes, you can use anything*. Anything online, your own notes, my slides, books… But no teamwork at the time of

*test*! I would like to encourage studying together as you prepare for the tests. But the tests have to be answered independently. Aren't you interested to see the results?

Plagiarism is not tolerated at ETSU. The instructors reserve the right to use plagiarism detection technology. Cheating of any kind will result in a zero for the task in question or an F for the entire course.

Cheaters may be referred to the Department Chair and the Dean of the College of Arts and Sciences.

### Grading :

6 take-home quizzes x 10 pts = 60 points;

4 formal lab reports x 15 points = 60 points ;

4 HW assignments x 5 points = 20 points ;

Lab exam = 70 points.

Total = 210 points.

 $90 - 100\% \rightarrow A$ ;  $80 - 90\% \rightarrow B$ ;  $70 - 80\% \rightarrow C$ ;  $60 - 70\% \rightarrow D$ ; less than  $60\% \rightarrow F$ . And I mean it.

Top and bottom 1/3 of each bracket are +'s and -'s, respectively (No A+ or D-) Please ask me any questions.

## **LEARNING OUTCOMES:**

Topics associated with the learning outcomes in the Biology Curriculum that might be considered a minimal degree of knowledge and comprehension for a student having completed the Genetics Laboratory class:

Students can explain the factors that cause change in genetic structure over time.
 Students can explain the flow of genetic information among levels of biological organization.

3. Students will be able to use phylogenies to interpret patterns of evolution and relationships among organisms.

<u>SKILLS:</u> By the end of the course, students will be able to:

- Understand hypothesis-driven and evidence-based research.
- Identify accurate and reliable sources of information.
- Apply rigorous experimental design and data collection.
- Evaluate scientific results in context of methods or protocols used.
- Construct appropriate and testable hypotheses and derive predictions.
- Use effective representations and visualizations for biological data.
- Articulate methods and knowledge in written and oral forms.
- Interpret data from various sources to develop an appropriate conclusion and recognize knowledge gaps.
- Apply statistical and bioinformatics tools to analyze and interpret diverse biological data.
- Apply biological research to address societal problems.

Proposed schedule, subject to changes.

Date       Theoretical introduction       Drosophila       Other       Due       "Homework quiz"         23       at the computer lab.       Description       Bioinformatics       Description       Secondary       Mendel's laws.						
Aug 23Bioinformatics, will be at the computer lab.Bioinformatics, practical task, Homework due next week.Bioinformatics, homework due next week.Bioinformatics, homework due next week.Bioinformatics, practical task, homework due next week.Bioinformatics, homework due next week.Mendelian genetics, Chi square.Sept 6Alleles, Polymorphism, Genetic equilibrium in populationsLearn to handle observe mutants, Setup Drosophila dihybrid crossesHuman Hemoglobin, homework due next weekHemoglobin homework due next weekHemoglobin homework equilibriumSept 20DNA restriction and its technology)Drosophila dihybrid cross; collect F1, setup F2.Plasmid restriction mapping – restrictio	Date	Theoretical introduction	Drosophila	Other	Due	"Homework quiz"
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