

# **BIOLOGY 481 (563)**

## ***Experimental Evolutionary Ecology***

Lecture: 320 HCK, Tues/Thurs, 2:30-3:50pm

Lab: 343 HCK, Tues, 8:30am-10:20am OR 10:30am-12:20pm

Class website: <http://faculty.washington.edu/kerrb/biol481/>

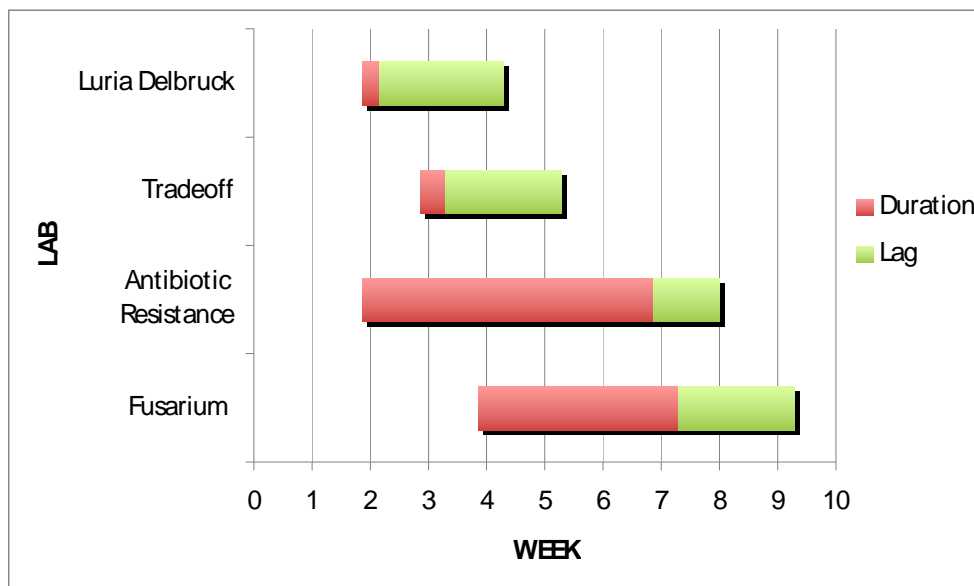
### **Class Schedule:**

<b>Date</b>	<b>Day</b>	<b>Lecture Topic</b>	<b>Instructor</b>	<b>Lab Topic</b>
Oct. 1	Thursday	Course Overview	Tewksbury, Kerr	
<b>Oct. 6</b>	<b>Tuesday</b>	<b>Natural Selection</b>	<b>Tewksbury</b>	<b>Lab Overview</b>
Oct. 8	Thursday	The Nature of Mutation	Kerr	
<b>Oct. 13</b>	<b>Tuesday</b>	<b>Diversity Gradients</b>	<b>Tewksbury</b>	<b>Luria-Delbrück Lab (start Antibiotic Res. Lab)</b>
Oct. 15	Thursday	Tradeoffs and Diversity	Kerr	
<b>Oct. 20</b>	<b>Tuesday</b>	<b>Coevolution</b>	<b>Tewksbury</b>	<b>Tradeoff Lab</b>
Oct. 22	Thursday	Local Adaptation	Tewksbury	
<b>Oct. 27</b>	<b>Tuesday</b>	<b>Statistical Analysis I</b>	<b>Kerr</b>	<b>Fusarium I</b>
Oct. 29	Thursday	Approaches and Questions in Ecology	Tewksbury	
<b>Nov. 3</b>	<b>Tuesday</b>	<b>Adaptive Landscapes</b>	<b>Kerr</b>	<b>Fusarium II</b>
Nov. 5	Thursday	The Problem of Drug Resistance	Kerr	
<b>Nov. 10</b>	<b>Tuesday</b>	<b>The Evolution of Virulence</b>	<b>Kerr</b>	<b>Antibiotic Resistance Lab</b>
Nov. 12	Thursday	Fragmentation, Connectivity, and Dispersal	Tewksbury	
<b>Nov. 17</b>	<b>Tuesday</b>	<b>Populations and Communities</b>	<b>Tewksbury</b>	<b>Fusarium III</b>
Nov. 19	Thursday	Ecology of Climate change II	Tewksbury	
<b>Nov. 24</b>	<b>Tuesday</b>	<b>Historical Contingency</b>	<b>Kerr</b>	<b>Statistical Analysis II</b>
Nov. 26	Thursday	THANKSGIVING		
<b>Dec. 1</b>	<b>Tuesday</b>	<b>Plasticity and Learning</b>	<b>Kerr</b>	
Dec. 3	Thursday	The Evolution of Cooperation	Kerr	
<b>Dec. 8</b>	<b>Tuesday</b>	<b>Instructor Mini-Symposium</b>	<b>Tewksbury, Kerr</b>	
Dec. 10	Thursday	Final Presentations	--	Final Presentations

**Labs:**

In many of the labs, you will be working in groups of four (you will choose these groups during the “Lab Overview” on Oct. 6). Several of these labs will require (at least part of) your group to come to the laboratory during off hours. For instance, the Antibiotic Resistance Lab (in which your group will be evolving bacteria) runs for a total of 30 days. Thus, every day during these 30 days (excluding weekends), at least one member of your group must spend about 15 minutes in the lab transferring bacterial cultures. Below is a table that gives the start and end dates for each of the labs and a break down for each day of the labs (in terms of time and number of group members required). The dates the lab reports are due are also listed. These reports should be submitted on-line (follow the [Turn In Your Report](#) link on the class website) by 9:59pm of the listed date.

Lab	Start Date	End Date	Effort Breakdown	Due Dates
Lab Overview	Oct. 6	Oct. 6	Day 1: full lab session (full group)	
Luria-Delbrück Lab	Oct. 13	Oct. 15	Day 1: full lab session (full group) Day 3: 45 min. (1 group member)	Friday, Oct. 30 (Lab Report)
Tradeoff Lab	Oct. 20	Oct. 22	Day 1: full lab session (full group) Day 2: 1.5 hr. (2 group members) Day 3: 30 min. (1 group member)	Friday, Nov. 6 (Lab Report)
Fusarium I	Oct. 27	Oct. 27	Day 1: full lab session (full group) (meet with group outside of class to discuss peer reviews)	Tuesday, Oct. 27 (hypothesis posted) Thursday, Oct. 29 (peer group reviews)
Fusarium II	Nov. 3	Nov. 3	Day 1: full lab session (full group) (meet with group outside of class to discuss revisions)	Tuesday, Nov. 3 (revised hypotheses due) Tuesday, Nov 10 (final hypothesis due)
Antibiotic Resistance Lab	Oct. 14	Nov. 12	Day 1-27: 15 min. (1 group member) Day 28: full lab session (full group) Day 29: 2 hr. (2 group members) Day 30: 30 min. (1 group member)	Wednesday, Nov. 25 (Lab Report)
Fusarium III	Nov. 17	Nov. 20	Day 1: full lab session (full group) Days 3-5: 1 hr. (2 group members)	Friday, Dec. 4 (Lab Report)
Statistical Analysis II	Nov. 24	Nov. 24	Day 1: full lab session (full group)	
Final Presentations	Dec. 10	Dec. 10		



## **Grading:**

The table below shows how the 140 total possible points for the course will be awarded. There are no formal exams in the course.

	<b>Total Points</b>
Lab Reports (10 points each)	40
Clicker Quiz Questions	30
Final Presentation (graded, in part, by other lab groups)	25
Online Assignments	25
Participation (in lecture, lab, GoPost, and with peer TAs)	10
Out-of-class talk summary	5
Peer evaluation (by your lab group mates)	5

Final grades will be calculated in the following manner, which assures that all students who master the material in the course will receive a good grade. Indeed, it is perfectly possible for everyone in the class to get a 4.0. We assure you that this outcome would please all of us! The 4.0 grade will be set at the 95<sup>th</sup> percentile of point totals for the whole class. For example, if our class has 60 students, anyone having at least as many points as the top 3 students in the class will get a 4.0. To get a passing grade (0.7) you must get  $\frac{1}{2}$  of the possible points in the class. The point scores between the grades of 4.0 and 0.7 will be divided into approximately equal intervals to assign the remaining grades.

### **Lab Reports ( $\approx 29\%$ of your grade):**

Each lab report should begin with a few paragraphs (no more than 1 page) discussing, in your own words, the central aim of the lab. You should then present your data **either in a graph or in tabular form**. Then you should discuss and interpret your data (again, no more than 1 page). Specifically, you should discuss what the data means, showing any relevant calculations (long-hand is fine) and performing any statistical tests (if we've talked about them). You should share any errors in the execution of the experimental protocol, and you can suggest further experimentation that you think relevant. Finally, there will be about 5 questions to answer at the end of most of the labs. Your answers should be both succinct and complete. Some labs will pose a "bonus question". This is worth 1 point if answered correctly. These bonus questions are meant to be challenging.

Lab reports will be scored for content, clarity, and style. **All lab reports are to be original, individual efforts.** You should feel free to discuss your data and questions with the instructors, the TAs, your lab group, and other lab groups, but the writing must be your own. Proper attribution must be given to all sources of ideas, text, and data. You should know and follow the UW policies regarding plagiarism and other academic misconduct:

<http://depts.washington.edu/grading/issue1/honesty.htm>.

Your name, email address, group name, and lab title should appear at the top of the first page (it doesn't hurt for your name to be in the header on every page). Please use 12 pt. font, single-spaced, with 1 inch margins. Any figures or tables should be clearly organized and should have legends. The lab report must be e-submitted (follow the [Turn In Your Report](#) link on the class website). Again, **the lab reports are due by 9:59pm on the day listed in the above table.**

Each lab group will meet with their assigned peer TA on Oct. 27, 28, or 29 (before the first lab report is due). This meeting will be to discuss the format of the lab reports generally and to address any questions.

### ***Clicker Quiz Questions (≈21% of your grade):***

You will need to purchase a “Turning Point” clicker within the first week of class and register it on the class website (follow the [Register Your Clicker](#) link).

The weekly quiz questions will be short (less than 5 minutes) and will be given every Tuesday and Thursday during lecture. The Tuesday quiz will cover any assigned reading. The Thursday quiz will cover both any assigned reading and potentially the lab protocol(s) for the laboratory the following week. These quizzes should not cause you any undue stress—if you have read the relevant material, the quiz should be fairly easy for you. Sometimes we will post some hints (follow the [Hints](#) link on the class website).

### ***Final Presentation (≈18% of your grade):***

During the final class of the quarter, each lab group (with 4 members) will give a single final presentation that will last 18 minutes (including questions). Each group will be (randomly) assigned to present one of the labs executed during the quarter. Each group member should speak during the presentation. We suggest that you aim to spend 16 minutes on the presentation and allow 2 minutes for questions. You might organize your presentation as follows:

*Potential structure* (each group member could speak for 4 minutes):

- 1) Introduction to the Ecological or Evolutionary Concept(s)
- 2) Overview of the Experiment (Design & Execution)
- 3) Presentation of the Data and Interpretation
- 4) General Implications of Results for Original Concept(s)

Presentations will be scored for content, clarity, and effective use of visual aids in conveying information. Overhead transparencies or PowerPoint slides are strongly recommended. We also strongly recommend that you practice your presentation as a group (to work out transitions and timing). At least part of your grade for this final project will come from the evaluations of other laboratory groups.

Each lab group will meet with their assigned peer TA on Dec. 2, 3, or 4 (a week before the final presentation). This meeting will be to discuss the format of the presentation generally and to address any lingering questions. We recommend that the group runs through a version of the presentation with their peer TA during this meeting.

### ***Online Assignments (≈18% of your grade):***

Comprehension of the readings, including lab protocols, will be assessed on-line (each worth 1 point). This will occur through WebQ surveys, which will close at 9:59pm the day before the lecture or lab covering the assigned reading. Follow the [Reading Comprehension Surveys](#) link on the class website. Hypothesis reports for the Fusarium Lab as well as peer group reports for the Fusarium Lab will also be collected on-line, each worth 2 points. These reports must be e-submitted (follow the [Turn In Your Report](#) link on the class website) **by 9:59pm on the day listed in the above table**. We will drop your 2 lowest scores (i.e., two uncompleted surveys).

### ***Participation (≈7% of your grade):***

The instructors and TAs will monitor your level of participation during lecture, lab, on-line discussions as well as meetings with your peer TAs. Regularly attending the lectures/labs and preparing by doing the reading is a prerequisite for participation. We strongly encourage you to come to lecture/lab ready to ask (and answer) questions.

### ***Out-of-class talk summary (≈4% of your grade):***

In order for you to get exposure to current topics within biology, we are asking you to attend one research talk outside of class. There will be many opportunities throughout the quarter (and a listing of links to departmental seminar series can be found by following the [Out-Of-Class Talks](#) link on the class website). After attending the talk, you will write a short summary (**no more than 1 page**). You will want to include the following information:

- Name of presenter, title of presentation, and the date of the talk
- A brief summary of the talk itself (including the question(s) driving the research, the experiments or data relevant to exploring the question(s), and the presenter's interpretation of the results). This should be no more than a few paragraphs.
- Pose a question that the talk stimulated for you

**This summary will be due at your last meeting with your peer TA (sometime during the period Dec. 2-4).**

### ***Peer evaluation (≈4% of your grade):***

You will be doing several group lab projects during the quarter, and your fellow group members are counting on you to participate (both in, and outside of, the laboratory sessions). At the end of the quarter your lab group mates will assign you a grade for the quality of your participation. Similarly you will evaluate your lab group mates. All evaluations will be done on-line before Dec. 10, 9:59pm (an email will be sent towards the end of the quarter about this).

### ***Contact Information:***

#### **Instructors:**

<b>Ben Kerr</b> <i>Office Hours:</i> 10-11am, Wednesdays; or by appointment <i>Office:</i> 404 Kincaid <i>Email:</i> kerrb@u.washington.edu	<b>Josh Tewksbury</b> <i>Office Hours:</i> by appointment <i>Office:</i> 528 Kincaid <i>Email:</i> tewksjj@u.washington.edu
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#### **Teaching Assistants:**

<b>Kelsey Byers</b> <i>Office Hours:</i> by appointment <i>Office:</i> Plant Lab <i>Email:</i> kjbyers@uw.edu	<b>Karen Reagan</b> <i>Office Hours:</i> by appointment <i>Office:</i> 522 Kincaid <i>Email:</i> sphitz@u.washington.edu
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#### **Peer Teaching Assistants:**

<b>Carrie Glenney</b> <i>Email:</i> carrieglenney@yahoo.com	<b>Hannah Jordt</b> <i>Email:</i> hljordt@u.washington.edu
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