Environmental Microbiology Lab 375:312 and 375:512
Fall

Lecture: Monday, 10:55 a.m. – 12:15 p.m. Room 109 CDL

Lab: Sect. 1 – Monday, 12:35 – 3:35 p.m. Room 203 ENR
     Sect. 2 – Thursday, 12:35 – 3:35 p.m.
     Sect. 3 – Tuesday, 5:35 – 8:35 p.m.

Dr. Craig Phelps
Dr. Abigail Porter

Lab Manual

There is no required manual for this course. Lab modules (handouts) will be posted and available for download from the class’ SAKAI website.

Grading

- Attendance to all laboratory periods is expected. If you need to miss a class, please inform the instructor as soon as possible. It is not acceptable to attend a different section without approval.

- Lab results are due at the beginning of the lab period following collection of the final data.

- The Final Grade will be based on class participation (20 points), 9 lab results (10 points each), 11 pre-quizzes (5 points each), and 2 lab reports (50 points each).

  (Graduate students will also be responsible for completing a separate 10 page term paper (50 points))

- Lab Reports: You will be required to write two full lab reports (Labs #5 and #8) during the semester. Each lab report will be due in class 3 weeks after the final data is collected. See the Lab Report Guide for instructions.

- Term papers (graduate students only) will be a critique of a current or newly proposed method used in environmental microbiology. The focus of discussion should be the strengths and limitations of the method as compared to alternatives. Papers should be ~10 pages long plus figures and refer to at least 5 original research papers. Topics need to be approved by the instructor. Titles and Outlines are due on October 31st. Final papers are due on December 10th.

Ethics

- Plagiarism of any kind will not be tolerated. All students are required to turn in their own work and properly attribute all sources. Failure to do so will result in a failing grade.

- It is expected that lab groups will collaborate on calculations and interpretations of experiments on lab reports. Other questions should be answered independently.
Safety

1. Read and understand each lab procedure before starting the lab.
2. Wear safety goggles whenever working with chemicals, flame or anything that may be infective.
3. Lab coats are recommended but not required.
4. Treat all chemicals as potentially hazardous and dispose of waste according to instructions.
5. No eating, drinking or applying make-up in the lab.
6. Tie back any long hair.
7. No loose clothing or open-toed shoes.
8. No horseplay.
9. At the end of each class
   1) Put away all materials
   2) Rinse any used glassware
   3) Disinfect the lab bench
   4) Wash your hands before leaving.

Learning Goals

Students completing this class will have learned:

1. how to apply math and basic science knowledge to interpret and solve environmental problems;
2. skills and techniques necessary for a successful career in the field;
3. how to design and conduct experiments and to analyze and interpret data;
4. how to work effectively in multidisciplinary teams;
5. how to communicate technical information effectively;
6. about contemporary environmental issues.

Contact Information:  

Dr. Phelps  
(848) 932-5713  
phelps@envsci.rutgers.edu  

Dr. Porter  
(848) 932-6382  
awporter@rci.rutgers.edu  

Office Hours:  

Dr. Phelps:  
Rm. 229 ENR  

Dr. Porter:  
by appointment
## Schedule

<table>
<thead>
<tr>
<th>Month</th>
<th>Week</th>
<th>Lecture</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sept.</td>
<td>XX</td>
<td>Lecture #1: Class policies, Safety and Introduction</td>
<td>Lab #1: Sampling Trip (Passion Puddle)</td>
</tr>
<tr>
<td></td>
<td>XX</td>
<td>Lecture #2: Microbial Physiology I</td>
<td>Lab #2: Microscopy</td>
</tr>
<tr>
<td></td>
<td>XX</td>
<td>Lecture #3: Microbial Physiology II</td>
<td>Lab #3: Bacterial Culture and Transfer</td>
</tr>
<tr>
<td>Oct.</td>
<td>XX</td>
<td>Lecture #4: Bacterial Metabolism</td>
<td>Lab #4: Winogradsky’s Battery</td>
</tr>
<tr>
<td></td>
<td>XX</td>
<td>Lecture #5: Bacterial Growth</td>
<td>Lab #5: Enumeration + Growth Curve</td>
</tr>
<tr>
<td></td>
<td>XX</td>
<td>Lecture #6: Coliform Lecture</td>
<td>Lab #6: Coliform Testing</td>
</tr>
<tr>
<td></td>
<td>XX</td>
<td>Lecture #7: Biofilms</td>
<td>Lab #7: Biofilm Lab</td>
</tr>
<tr>
<td>Nov.</td>
<td>XX</td>
<td>Lecture #8: Soil Enzymes and Polymerases</td>
<td>Lab #8: Alkaline Phosphatase</td>
</tr>
<tr>
<td></td>
<td>XX</td>
<td>Lecture #9: DNA Techniques I</td>
<td>Lab #9: DNA Extraction + Electrophoresis</td>
</tr>
<tr>
<td></td>
<td>XX</td>
<td>Lecture #10: DNA Techniques II</td>
<td>Lab #10: PCR</td>
</tr>
<tr>
<td></td>
<td>XX</td>
<td>No Lecture</td>
<td>Lab #10: Results</td>
</tr>
<tr>
<td></td>
<td>XX</td>
<td>Lecture #11: Biogeochemistry</td>
<td>Lab #11: Nitrogen Cycle</td>
</tr>
<tr>
<td>Dec.</td>
<td>XX</td>
<td>Wrap up</td>
<td></td>
</tr>
</tbody>
</table>

Environmental Microbiology Lab

375:312 and 375:512