Advanced Microbiology with Lab  
BIOL 822 (Online Course)  
Spring 2017

Course Description

This course will focus on developing laboratory-based microbiology techniques as well as providing a theoretical knowledge-base for these techniques. Advanced Microbiology will consist of two parts: a lecture component and a laboratory component. The lecture will be designed to support laboratory experimentation that the students will be conducting throughout the semester.

Learning Objectives

1. Understand microbe and microbe communities  
2. Analyze microscopy slides to determine bacterial morphology  
3. Describe how microbes grow and be able to dilute liquid cultures to develop specific cell culture densities  
4. Understand bacterial metabolism  
5. Identify bacteria based on how they metabolize different fuel sources  
6. Understand how bacteria and transmitted  
7. Understand and analyze bacterial inhibition through antibiotic treatment

Instructor

Dr. Rachel Hellmann Whitaker  
Office Location: Bruner Hall of Science (BHS) 315  
Phone: 308-865-8085 (Instructor)  
308-865-8548 (Biology Department)

Email: whitakerra@unk.edu  
Office hours: 10-11am Mon, Tue, Thu; and by appointment  
Blackboard discussion boards: you may also post general comments/questions/concerns on weekly discussion boards. Please ensure that these questions are general (rather than pertaining to you specifically).

As this is an online course, email or posts on the weekly discussion board are the best ways to contact me. I will respond to emails and discussion board posts within 48 hours.
Course Materials

- **Technical Requirements:** Full access to a computer and Internet are required for this course. You also need to dedicated space for at-home experimentation.

Course Structure

I will have all weekly materials up on Blackboard by Monday, and an announcement will always go up at this same time letting you know that all materials are up, and provide any information and other details you need to know for that particular week.

Each week I will post:
- Video lectures
- Notes/outline corresponding to the lecture videos
- Assigned readings from the textbook or supplemental readings that I will provide you
- Weekly Laboratory experiment and instructions
- Link to the week’s discussion board for questions/concerns/comments
- Possibly occasional short length movies to help understand concepts

Assessments

Your progress in class will be assessed by weekly quizzes and 4 Exams.

- **Quizzes**
  - Weekly, there will be a laboratory experiment. You will be expected to turn in lab reports on the following week. Each lab report will be worth 100 pts, there are 12 labs total.

- **Exams**
  - 100pts each (total of 4 Exams)
  - Multiple choice, matching, fill-in the blank, short answer questions
  - 1 attempt only
  - 6-day access to each Exam
  - The final Exam is partially comprehensive and all other exams will cover topics from indicated lectures (see class schedule)

- **Grades**
3 Regular Exams* (100pts each) – 300pts
1 Final Exam** (100pts) – 100pts
1 Introduction post – 5pts
1 Initial writing assignment – 5pts
12 Quizzes (100 pts each)– 1200pts

**TOTAL: 1610pts**

* Regular Exams will cover topics from indicated lectures
** Final Exam will be partially comprehensive, i.e. 50% comprehensive, 50% focused on topics from indicated lectures

**Grade Assignment**

Final grades will be assigned using the following grading scale:
All grades are final unless there is a calculation error.

**Expectations from students**

- As students enrolled in this class it is your responsibility to log in to blackboard every week and keep up with all weekly course materials. Seek help when you need it and do not wait till the last moment to do this.

- You must log on to Blackboard at least weekly and keep up with the announcements that I post. You will not get an email of all the announcements so you MUST check in to Blackboard and make sure that you keep up with the Announcements and stay informed about what is happening and going to happen in class.

- It is your full responsibility to complete Exams within the time that they are available. Exams are available for 6 days and 2– **In the exceptional situation that an extension is provided I will require documentation of a legitimate excuse (fully up to my discretion)**. Lab reports are due the following week after finishing the lab experiment.

- All exams (except the final) will be available from Tuesday– Monday. You MUST do your exams within this time frame. Once the exam is closed, it will remain closed. Therefore, please plan ahead to make sure that you get your exam done in time.

- Understandably, you all have several commitments in your life other than this class. Nonetheless, as a student who has registered for this class, it is absolutely your full responsibility to ensure that you can meet the time requirements of this class, and any deadlines
Class Policies

- **Policy on plagiarism:** Anyone caught plagiarizing any exercise you will receive a 0 for that exercise; subsequent violations will result in referral to the Vice Chancellor for Academic Affairs for dismissal from the university.
- **Policy on incomplete:** To be considered for an incomplete in Biology 830P:
  1. You must submit the reasons you cannot complete the scheduled work. This must include a copy of your class schedule and description of your responsibilities outside the classroom. This should be done in writing and include confirmation from your employer or doctor when appropriate.
  2. You must specify the assignments you have missed and a schedule of plans to complete them.
  3. You must submit a copy of the above information to the Chair of the Department of Biology and the Dean of Natural and Social Sciences.
  4. Upon completion of items 1-3, your request for an incomplete will be considered.

I expect all students to progress through the requirements for Biology 846 in a timely fashion. Unless your circumstance is quite remarkable, do not consider an incomplete.

- **Extensions or rescheduling** of Exams and quizzes will NOT be possible unless circumstances are exceptional – a legitimate excuse (based on my discretion) with provided documentation will be required for such considerations.
- **Assignments, quizzes, exams will receive zero (0) points if they are not completed within the given due dates**

Students with Disabilities or Students Who are Pregnant

It is the policy of the University of Nebraska at Kearney to provide flexible, individualized, and reasonable accommodations to students with documented disabilities or students who are pregnant. To receive accommodation services for a disability, students must be registered with UNK Disabilities Services. Contact David Brandt, in the Academic Success Office, 163 Memorial Student Affairs Building, 308-
865-8214 or by email brandttdl@unk.edu to register. For students needing accommodation due to pregnancy, you need to contact Student Health. (The following link provides information for students and faculty regarding pregnancy rights. http://www.nwlc.org/resource/pregnant-and-parenting-students-rightsfaqs-college-and-graduate-students) Students with disabilities or students who are pregnant need to provide the proper documentation from Disability Services or Student Health to their faculty members in order to receive academic accommodations. Anyone who feels they were not afforded these rights, should contact the campus Title IX/ADA Officer at 308-865-8655. Attached is the link to the above statement for your convenience. http://www.unk.edu/offices/disabilityservices.aspx?id=13673 Please keep in mind that accommodations become valid only after I sign relevant paperwork, therefore if you require any accommodations please contact me, and the relevant office as soon as possible.

**Reporting Student Sexual Harassment, Sexual Violence or Sexual Assault**

Reporting allegations of rape, domestic violence, dating violence, sexual assault, sexual harassment, and stalking enables the University to promptly provide support to the impacted student(s), and to take appropriate action to prevent a recurrence of such sexual misconduct and protect the campus community. Confidentiality will be respected to the greatest degree possible. Any student who believes she or he may be the victim of sexual misconduct is encouraged to report to one or more of the following resources:

- Local Domestic Violence, Sexual Assault Advocacy Agency 308-237-2599
- Campus Police (or Security) 308-627-4811
- Title IX Coordinator 308-865-8655

**Tentative Class Schedule, BIOL 822, Spring 2017**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Assignment/Quiz/Exam</th>
<th>Reading</th>
<th>Week</th>
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</thead>
<tbody>
<tr>
<td>Introduction, Syllabus</td>
<td>Introduction post and writing assignment (due: Jan 18th)</td>
<td>-</td>
<td>1</td>
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<tr>
<td>Lecture: Humans and the Microbial World Lab: Microbiology-Rules for Success</td>
<td>-</td>
<td>Chapter 1</td>
<td>2</td>
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<tr>
<td>Lecture: Microscopy and Cell Morphology Lab: Microscopy and Microbiology</td>
<td>Microbiology-Rules for Success lab assignment</td>
<td>Chapter 2</td>
<td>3</td>
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<tr>
<td>Lecture: Microscopy and Cell Morphology</td>
<td>Microscopy and Microbiology lab report</td>
<td>Chapter 2</td>
<td>4</td>
</tr>
<tr>
<td>Lab: Bacterial Morphology and Staining Techniques</td>
<td><strong>Exam 1</strong> (Covers Module 1, Wk 2-4 material) Bacterial Morphology and Staining Techniques lab report</td>
<td>Chapter 4</td>
<td>5</td>
</tr>
<tr>
<td>Lecture: Dynamics of Prokaryotic Growth</td>
<td>Aseptic Technique and Culturing Microbes lab report</td>
<td>Chapter 4</td>
<td>6</td>
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<tr>
<td>Lab: Environmental Influences on Microbial Growth</td>
<td>Bacterial Enumeration and Plate Counts lab report</td>
<td>Chapter 4</td>
<td>7</td>
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<tr>
<td>Lecture: Control of Microbial Growth</td>
<td>Environmental Influences on Microbial Growth lab report</td>
<td>Chapter 5</td>
<td>8</td>
</tr>
<tr>
<td>Lab: Antibiotic Sensitivity</td>
<td><strong>Exam 2</strong> (Covers Module 2, Wk 5-8 material) Fomite Transmission lab report</td>
<td>Chapter 5</td>
<td>9</td>
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<tr>
<td>Lecture: Identification and Classification of Prokaryotic Organisms</td>
<td>Antibiotic Sensitivity lab report</td>
<td>Chapter 10</td>
<td>10</td>
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<tr>
<td>Lab: Bacterial Identification through Functional Media</td>
<td>Bacterial Identification through Functional Media lab report</td>
<td>Chapter 6</td>
<td>12</td>
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<tr>
<td>Lecture: Metabolism: Fueling Cell Growth</td>
<td>Biochemical testing-Carb Fermentation testing</td>
<td>Chapter 6</td>
<td>12</td>
</tr>
<tr>
<td>Lab: Biochemical testing-Methyl Red, Vogues and Catalase</td>
<td><strong>Exam 3</strong> (Covers Module 3, Wk 9-12 material) Biochemical testing-Carb Fermentation testing lab report</td>
<td>Chapter 6</td>
<td>13</td>
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<tr>
<td>Lecture: Food Microbiology</td>
<td>Biochemical testing-Methyl Red, Vogues and Catalase lab report</td>
<td>Chapter 32</td>
<td>14</td>
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<td>Lab: Food Safety</td>
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<tr>
<td>Lecture: Host-Microbe Interactions</td>
<td>Food Safety lab report</td>
<td>Chapter 17</td>
<td>15</td>
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<tr>
<td>Q &amp; A</td>
<td>Q &amp; A FINAL EXAM</td>
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<td>16</td>
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<tr>
<td>FINALS</td>
<td>FINAL EXAM (Covers all modules, Wk 2-14 material)</td>
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<td>17</td>
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<td></td>
<td>FINALS WEEK</td>
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- Lab reports will be due the following week after their completion
- During Exam weeks, Exams will be available from 12:00pm (CST) on Tuesdays until Monday 12:00pm (CST)
- The final Exam will be available on the 12:00pm (CST) Thursday before finals week till Wednesday 12:00pm (CST) of finals week