Eastfield College  
STEM Division  
Biology 2420-43004  
Microbiology for Non-Science Majors  
Spring 2019

Class Time and Location  
Lecture: TR 11:00am-12:20pm C261  
Lab: TR 12:30-2:30pm S300

Instructor  
Dr. Jessica Kerins  
Office: C309  
Office Phone: 972-860-8317  
Office Hours:  
1/22-3/21: MW 8:30-9:30am C309, MW 12:30-1:00pm C309, TR 10:00-11:00am C309  
3/25-5/14: TR 8:30-11:00am C309

Course Description (4 Credit Hours)  
Study of the morphology, physiology, and taxonomy of representative groups of pathogenic and nonpathogenic microorganisms. Emphasis is placed on applications to humans. Pure cultures of microorganisms grown on selected media are used in learning laboratory techniques. Includes a brief preview of food microbes, public health, and immunology. Designed for non-science majors and allied health students. (3 Lec., 4 Lab.)

Coordinating Board Academic Approval Number 2605035103

Prerequisites  
Biology 1406 or SCIT 1407 or BIOL 2401. One of the following must be met: (1) Developmental Reading 0093 AND Developmental Writing 0093; (2) English as a Second Language (ESOL) 0044 AND 0054; or (3) have met Texas Success Initiative (TSI) in Reading and Writing standards AND DCCCD Writing score prerequisite requirement. Student cannot take both BIOL 2420 and BIOL 2421 to satisfy the core science credit.

REQUIRED Materials

1. Textbook:  

2. Lab book:  

3. Homework access code for Modified MasteringMicrobiology (found at www.masteringmicrobiology.com).  
   NOTE: if you buy the ebook from the Eastfield College bookstore, the access code is already included. You MUST have access to the online site in order to complete your weekly homework assignments.

   NOTE: the bookstore is offering only the eBook version of the textbook. If you wish to purchase an actual book, you can find one on the Pearson website (www.masteringmicrobiology.com), or other places, such as Half Price Books. You still need the access code.

Course Objectives  
To provide an understanding of the life processes, using microorganisms as the prototype of living things. Provide a foundation for future courses in biology, especially advanced microbiology and a background for the professions such as agriculture, food science, public health and medicine. Provide a background for an understanding of the scientific method and the knowledge to understand the scope of ecology and environmental science.
Student Learning Outcomes
Upon successful completion of this course, students will:

Lecture
1. Provide examples of the impact of microorganisms on agriculture, environment, ecosystem, energy, and human health, including biofilms.
2. Identify unique structures, capabilities, and genetic information flow of microorganisms.
3. Compare the life cycles and structures of different types of viruses.
4. Discuss how microscopy has revealed the structure and function of microorganisms.
5. Give examples of the range of metabolic diversity exhibited by microorganisms, impact of metabolic characteristics on growth, and control of growth.
6. Describe evidence for the evolution of cells, organelles, and major metabolic pathways from early prokaryotes and how phylogenetic trees reflect evolutionary relationships.
7. Describe the causes and consequences of mutations on microbial evolution and the generation of diversity as well as human impacts on adaptation.
8. Classify interactions of microorganisms on human and non-human hosts as neutral, detrimental, or beneficial.

Lab
1. Apply scientific reasoning to investigate questions and utilize scientific tools such as microscopes and laboratory equipment to collect and analyze data.
2. Use critical thinking and scientific problem-solving to make informed decisions in the laboratory.
3. Communicate effectively the results of scientific investigations.
4. Provide examples of the impact of microorganisms on agriculture, environment, ecosystem, energy, and human health, including biofilms.
5. Identify unique structures, capabilities, and genetic information flow of microorganisms.
6. Compare the life cycles and structures of different types of viruses.
7. Discuss how microscopy has revealed the structure and function of microorganisms.
8. Give examples of the range of metabolic diversity exhibited by microorganisms, impact of metabolic characteristics on growth, and control of growth.
9. Describe evidence for the evolution of cells, organelles, and major metabolic pathways from early prokaryotes and how phylogenetic trees reflect evolutionary relationships.
10. Describe the causes and consequences of mutations on microbial evolution and the generation of diversity as well as human impacts on adaptation.
11. Classify interactions of microorganisms on human and non-human hosts as neutral, detrimental, or beneficial.

Core Objectives
BIOL 2420 develops the following Core Objectives: Critical Thinking - to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information. Communication - to include effective development, interpretation and expression of ideas through written, oral and visual communication. Empirical and Quantitative Skills - to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions. Teamwork - to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal.

Core Objective Development Statements
BIOL 2420 develops Critical Thinking and Empirical and Quantitative Skills by requiring students to research, analyze and interpret data derived from an experimental setting and drawing a well-informed conclusion of the data through the application of sound biological concepts.
Examples: research paper, case studies, lab report
BIOL 2420 develops Teamwork and Communication by requiring students to effectively work in a small group on an assigned problem, exercise or course concept that will then be presented in a written, oral or visual format.
Examples: lab experiment, group teaching of course topic, case study, group research project.
Evaluation Procedures

<table>
<thead>
<tr>
<th>Evaluation Item</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>1 Syllabus quiz</td>
<td>20</td>
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<tr>
<td>1 Campus Emergency Quiz</td>
<td>14</td>
</tr>
<tr>
<td>4 Lecture exams x 100 points each</td>
<td>400</td>
</tr>
<tr>
<td>3 Laboratory exams x 100 points each</td>
<td>300</td>
</tr>
<tr>
<td>1 Laboratory report (identification of unknowns)</td>
<td>100</td>
</tr>
<tr>
<td>7 Highest Pre-lab quizzes x 10 points each</td>
<td>70</td>
</tr>
<tr>
<td>7 Highest Post-Lab worksheets x 10 points each</td>
<td>70</td>
</tr>
<tr>
<td>15 Homework assignments x 10 points each</td>
<td>150</td>
</tr>
<tr>
<td>Class participation/attendance</td>
<td>50</td>
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<tr>
<td>Class activities</td>
<td>76</td>
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</table>

TOTAL POINTS = 1250 points

Lecture exams will be taken during class time and may consist of matching, true/false, multiple choice and essay questions. You will need a scantron for each exam.

Laboratory exams will be taken during lab time. They may consist of fill-in-the-blank, multiple choice and/or short answer essay questions.

Testing Policies:
Make-up exams
There are NO make-up exams in this class. If a student knows that a LECTURE exam will be missed, it is the student’s responsibility to arrange to take the exam BEFORE the posted exam date. There are NO options to make up a lab exam.

During exams
Students are not allowed to leave the room for any reason during an exam. All electronic devices must be turned off and put away, in addition to all other personal items, during an exam.

Laboratory Report
You will be given a culture of an unknown microorganism and asked to identify the organism through standard techniques available to you in the lab. You will write a formal paper on the project that will include your lab journal entries, a flow chart, and a descriptive chart. Specific details will be given during the semester. Students are expected to work independently when conducting the biochemical experiments for the lab report. All staining, microscopy, inoculations and evaluations must be completed ALONE, without the help of fellow students. Students may ask opinions from each other regarding the appearance of test results, but the interpretation must be completed independently. If someone in the class helps you all student participants will receive a grade of ZERO for the paper. The instructor may not be consulted during the experiment process.

Pre-lab quizzes will be given at the beginning of each new lab period (usually on Tuesdays). Lab quizzes cover material that you will use in the upcoming lab. They may consist of fill-in-the-blank, multiple choice, and/or short answer essay questions. If you miss a lab period or arrive late, you CANNOT make up a lab quiz.

Post-lab worksheets summarize the experiments completed in lab each week. They are due by the end of the lab period every Thursday, NO EXCEPTIONS.

Homework assignments review the important material from each chapter. Each assignment is completed through the textbook’s companion website, www.masteringmicrobiology.com, and consists of tutorials, activities, and multiple choice questions.

Class participation/attendance
ACTIVE participation in this class is necessary if you want to do well. I expect each student to be prepared and to fully engage in lecture (ask/answer questions, contribute to discussions, contribute equally to any group activities). During lab, I expect each student to perform the tasks of the day; DO NOT rely on your tablemates to do the work for you, or you will lose points! You MUST be a contributing member of your group! This grade also

A standard grading scale will be used:

<table>
<thead>
<tr>
<th>Points Range</th>
<th>Percentage Range</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>1125 - 1250</td>
<td>90 - 100%</td>
<td>A</td>
</tr>
<tr>
<td>1000 - 1124</td>
<td>80 - 89%</td>
<td>B</td>
</tr>
<tr>
<td>875 - 999</td>
<td>70 - 79%</td>
<td>C</td>
</tr>
<tr>
<td>750 - 874</td>
<td>60 - 69%</td>
<td>D</td>
</tr>
<tr>
<td>0 - 749</td>
<td>0 - 59%</td>
<td>F</td>
</tr>
</tbody>
</table>
includes adherence to the attendance policy, which is described below. You will be working in teams for much of
the semester, so it is important that you treat each other fairly and with respect, as well as be able to resolve
conflict in an adult manner

Class activities consist of various in-class activities, such as quizzes, worksheets, and case studies. They may
or may not be announced ahead of time. You MUST be present in class to complete these activities and
receive credit for them. No make-up assignments will be given.

NO LATE WORK WILL BE ACCEPTED IN THIS CLASS FOR ANY REASON, SO PLEASE PLAN AHEAD!
“Late” means submitted or turned in after the established due date and time. An assignment submitted 1 minute
after the deadline is considered late, and therefore will not be graded.

How your final grade is determined
Grades are calculated using the above point system. You accumulate points with exams, quizzes, and possible
additional assignments. The number of points you have accumulated at the end of the semester will determine
your letter grade.

I DO NOT round up grades.

I DO NOT give incompletes.

DO NOT ask me about extra credit. If I decide to give extra credit assignments, I will tell you. DO NOT ask me,
“Is there anything I can do to raise my grade?” as my answer will be, “Yes, you should have worked harder from
day one.”

Questions about your grade
Any questions about your grade for a particular exam, quiz, or assignment MUST be addressed within ONE
WEEK of the posted deadline of that test/assignment, unless additional instructions say otherwise. After that
time, no grade appeals will be heard.

Class Policies

Attendance
Attendance is mandatory for both class and lab. Students are expected to be on time and remain for the entire
class/lab.

You may miss 3 classes or labs without penalty. After that, I will note each additional absence and each will
affect your teamwork grade. I do not distinguish between excused and unexcused absences, so there is no need
to notify me.

If you arrive late to class, it is YOUR responsibility to notify me IN WRITING BY THE END OF THAT CLASS
period that you were late. Failure to do so will result in you being marked absent. Please include the following:
1. First and last name
2. Date
3. Course and section
2 tardies equals 1 absence, therefore tardies will also affect your participation grade. They also affect your
group’s ability to complete assignments. PLEASE BE ON TIME!!

PLEASE NOTE:
1. Most of our labs are 2-day activities, with the bulk of the experiments being performed on Tuesdays. If
you are absent from lab on a Tuesday, is it not fair to expect your team members to catch you up and give
their data to you to analyze without you actually contributing to the experiment. This is especially true if
you are absent repeatedly on Tuesdays. Therefore, Tuesday absences will count against you MORE than
Thursday absences.

2. On Tuesday, 10/16/18 and Thursday, 10/18/18, each member of the class will perform a series of
biochemical experiments on a different microbe. Each student’s data is vital to the entire class for the
purpose of the Unknown Paper. Furthermore, these experiments give students the chance to practice performing the inoculations and reading/interpreting the results with the help of the instructor, before you complete these independently with your unknown bacterium. If you are absent on either of these days, each day will count as 2 absences.

YOU are responsible for finding out FROM YOUR CLASSMATES what you may have missed in class or lab. Refer to eCampus, the schedule, and other students to obtain this information, especially missed announcements. DO NOT ask me, “What did I miss?”

There are no make-up classes for laboratory exercises that are missed. You cannot attend another laboratory with another instructor to make-up the work.

Email
ALL email messages MUST include the following:
1. First and last name
2. Course and section
3. Detailed question, especially if it concerns a test question or a particular part of an assignment.

I will respond to any emails (or phone messages) within 24 hours.

PLEASE NOTE: I will not respond to the following emails:
   a. Any email that does not include any of the above items
   b. Any email that asks a question that has already been answered (check eCampus announcements, syllabus, etc. BEFORE emailing me!!)

Academic Honesty
You can find information about cheating, plagiarism and collusion at the Institutional Policies link below.

The first incident of academic dishonesty will result in a ZERO for that particular assignment or exam. The second incident will result in a failing grade for the course.

Drop Date Deadline
The last day to withdrawal from this class is April 17, 2019.

Classroom Etiquette
1. During lecture, cell phones, blackberries, pagers, ipods, headsets, and other personal electronics, are to be turned off and put away. Students are allowed to use laptop or notebook computers in class, but are expected to use them for classwork purposes only.
2. Be on time.
3. Be respectful of both the instructor and fellow students. This includes no talking during class, especially when the instructor or another student is speaking.

INSTITUTIONAL POLICIES
Institutional Policies relating to this course can be accessed from the following link:

FERPA: https://www.eastfieldcollege.edu/pages/privacysecurity.aspx?DCCCD_College=EFC#ferpa

The instructor reserves the right to amend this syllabus as necessary.
<table>
<thead>
<tr>
<th>Week (Tues-Mon)</th>
<th>Lecture</th>
<th>Lab</th>
<th>Assignments/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1 1/22-1/28</td>
<td>Ch. 1: A Brief History of Microbiology (p. 1-17) Ch. 3: Cell Structure and Function (p. 57-79)</td>
<td>2: Microscopy 3: Aseptical Transfers 4: Simple Stain &amp; Bacterial Smear</td>
<td>Due Monday, 1/28: Syllabus Quiz Campus Emergency Quiz</td>
</tr>
<tr>
<td>Week 2 1/29-2/4</td>
<td>Ch. 3: Cell Structure and Function (p. 57-79) Ch. 11: Characterizing and Classifying Prokaryotes Ch. 5: Microbial Metabolism (p. 125-143)</td>
<td>4: Simple Stain &amp; Bacterial Smear 5: Gram Stain 6: Acid-Fast Stain 7: Endospore Stain</td>
<td>Due TUES, 1/29 in lab: Dichotomous Key Part 1 Due Monday, 2/4: CH1 HW CH3 HW CH11 HW</td>
</tr>
<tr>
<td>Week 3 2/5-2/11</td>
<td>Ch. 5: Microbial Metabolism (p. 125-143)</td>
<td>8: Isolation of Microbes 9: Serial Dilution</td>
<td>Due Monday, 2/11: CH5 HW</td>
</tr>
<tr>
<td>Week 4 2/12-2/18</td>
<td>Ch. 6: Microbial Nutrition and Growth Catch-up/Review</td>
<td>10: Cultural Characteristics 11: Selective, Differential, and Enriched Media</td>
<td>Due THURS, 2/14 in lab: Dichotomous Key Part 2 Due Monday, 2/18: CH6 HW</td>
</tr>
<tr>
<td>Test 1: 1,3,11,5,6</td>
<td>Ch. 7: Microbial Genetics</td>
<td>Lab Exam #1: Labs 1-11</td>
<td>Due Monday, 2/25: None Test 1: Tues 2/19 Lab Exam #1: Thurs 2/21</td>
</tr>
<tr>
<td>Week 7 3/5-3/11</td>
<td>Ch. 9: Controlling Microbial Growth in the Environment Ch. 10: Controlling Microbial Growth in the Body</td>
<td>15: Antibiotic Susceptibility 16: Chemical Control of Microbial Growth</td>
<td>Due Monday, 3/18: CH9 HW CH10 HW</td>
</tr>
<tr>
<td>3/11-3/15</td>
<td>SPRING BREAK</td>
<td>SPRING BREAK</td>
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<tr>
<td>Week 9 3/26-4/1</td>
<td>Catch-up/Review Test 2: Ch. 7,9,10,13</td>
<td>Unknowns</td>
<td>Due Monday, 4/1: None Test 2: Thurs 3/28</td>
</tr>
<tr>
<td>Week 10 4/2-4/8</td>
<td>Ch. 14: Infection, Infectious Diseases, and Epidemiology Ch. 15: Nonspecific Lines of Defense</td>
<td>Unknowns</td>
<td>Due Monday, 4/8: CH14 HW</td>
</tr>
<tr>
<td>Week 12 4/16-4/22</td>
<td>Ch. 18: AIDS and Other Immune Disorders Catch-up/Review</td>
<td>19: Protozoa</td>
<td>Due Monday, 4/22: CH18 HW Last day to withdraw: 4/17</td>
</tr>
<tr>
<td>Test 3: Ch. 14-18</td>
<td>Ch. 19: Diseases of the Skin and Wounds Ch. 20: Diseases of the Nervous System and Eyes</td>
<td>21: Mycology: Fungi</td>
<td>Due Monday, 4/29: None Test 3: Tues 4/23</td>
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<tr>
<td>Week 15 5/7-5/13</td>
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<tr>
<td>Week 16 5/14-5/16* (*Tues-Th)</td>
<td>Test 4: Ch. 19-24 - IN LAB</td>
<td></td>
<td>Test 4: Tues 5/15 (11-12:50) IN LAB</td>
</tr>
</tbody>
</table>