BIOL 2420-Microbiology for Non-Science Majors Syllabus
Summer 2019
El Centro College

Course Information

Course Title: Microbiology for Non-Science Majors
Course & Section Number: BIOL 2420
Semester/Year: Summer, 2019
Credit Hours: 3 lec/3 lab

Instructor Information

Course Prerequisites

Students are required to have demonstrated college-level reading, writing, and/or math skills prior to enrolling in this course, and show successful completion of BIOL 1406 or SCIT 1407 or BIOL 2401

Course Description

An overview of the morphology, physiology and taxonomy of representative groups of pathogenic and non-pathogenic organisms. Emphasis is placed on applications to humans, and techniques used in growing pure cultures of microorganisms on selected media. A brief preview on public health issues is also represented. Designed for non-science majors and allied health students. (THECB # 26058035103)

Required Course Materials

Lecture: Choose one of the two options below.

(Note: Hard copy with access code may be purchased in lieu of eText)
OR
MICROBIOLOGY: BASIC AND CLINICAL PRINCIPLES Looseleaf Text and Modified Mastering Microbiology,
ISBN: 9780135194560 (This includes a loose leaf text book)
Laboratory


Sharpie Permanent Marker for labeling in lab (color is your choice)

Laboratory Coat

Note: A student of this institution is not under any obligation to purchase a textbook from a university-affiliated bookstore. The same textbook may also be available from an independent retailer, including an online retailer.

DROP DATE

The last day to drop for this semester and receive at grade of “W” is JULY 22, 2019 by 7pm in the Registrar’s Office (A130). Under Texas law, students who enroll in a Texas public institution of higher education (including DCCCD) for the first time in fall 2007 or later may not drop more than six courses during their entire undergraduate career.

Statement of Purpose and Core Objectives

Statement of Purpose:

Through the Texas Core Curriculum, students will gain a foundation of knowledge of human cultures and the physical and natural world, develop principles of personal and social responsibility for living in a diverse world, and advance intellectual and practical skills that are essential for all learning.

Core Objectives

Critical Thinking Skills (CT) - creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
Communication Skills (COM) - effective development, interpretation and expression of ideas through written, oral and visual communication
Empirical and Quantitative Skills (EQS) - manipulation and analysis of numerical data or observable facts resulting in informed conclusions
Teamwork (TW) - ability to consider different points of view and to work effectively with others to support a shared purpose or goal
**Lecture Student Learning Outcomes**

Upon successful completion of this course, students will:

1. Describe distinctive characteristics and diverse growth requirements of prokaryotic organisms compared to eukaryotic organisms.
2. Provide examples of the impact of microorganisms on agriculture, environment, ecosystem, energy, and human health, including biofilms.
3. Distinguish between mechanisms of physical and chemical agents to control microbial populations.
4. Explain the unique characteristics of bacterial metabolism and bacterial genetics.
5. Describe evidence for the evolution of cells, organelles, and major metabolic pathways from early prokaryotes and how phylogenetic trees reflect evolutionary relationships.
6. Compare characteristics and replication of acellular infectious agents (viruses and prions) with characteristics and reproduction of cellular infectious agents (prokaryotes and eukaryotes).
7. Describe functions of host defenses and the immune system in combating infectious diseases and explain how immunizations protect against specific diseases.
8. Explain transmission and virulence mechanisms of cellular and acellular infectious agents.

**Lab Student Learning Outcomes**

Upon successful completion of this course, students will:

- Use and comply with laboratory safety rules, procedures, and universal precautions.
- Demonstrate proficient use of a compound light microscope.
- Describe and prepare widely used stains and wet mounts, and discuss their significance in identification of microorganisms.
- Perform basic microbiology procedures using aseptic techniques for transfer, isolation and observation of commonly encountered, clinically significant bacteria.
- Use different types of bacterial culture media to grow, isolate, and identify microorganisms.
- Perform basic bacterial identification procedures using biochemical tests.
- Estimate the number of microorganisms in a sample using methods such as direct counts, viable plate counts, or spectrophotometric measurements.
- Demonstrate basic identification protocols based on microscopic morphology of some common fungi and parasites.
**Course Activities**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture Exams (6-lowest dropped)</td>
<td>100 pts each ---500 points total</td>
</tr>
<tr>
<td>Mastering Microbiology Assignments (21-lowest dropped)</td>
<td>5 points each ---100 points total</td>
</tr>
<tr>
<td>Laboratory Practicals (3-lowest dropped)</td>
<td>100 points each---200 points total</td>
</tr>
<tr>
<td>Laboratory Worksheets (25)</td>
<td>3 points each---75 points total</td>
</tr>
<tr>
<td>Laboratory Quizzes (11-lowest dropped)</td>
<td>10 points each---100 points total</td>
</tr>
<tr>
<td>Unknown Project</td>
<td>25 points total</td>
</tr>
</tbody>
</table>

**FINAL TOTAL: 1000 points possible**

**Grading Policy**

The total number of points earned will be translated into a letter grade as follows:

- A = 90-100% of points 900-1000 points
- B = 80-89.9% of points 800-899 points
- C = 70-79.9% of points 700-799 points
- D = 60-69.9% of points 600-699 points
- F = below 60% of points Below 600 points

To protect the privacy of the student, grades will be given only to the student or posted on ecampus. Grades will NOT be given via telephone, e-mail, FAX, text, or other correspondence. Unit exams may be reviewed by appointment with the instructor, prior to the next exam. No exams will be reviewed during the final exam week.

The purpose of the dropped lab quiz and lecture exam is to allow for emergencies that would prevent a student from coming to campus on test day, such as transportation problems, illness, or illness in the student’s family, and penalizing them for that test. **There are therefore no make-up exams or lab quizzes.**
Laboratory Quizzes
These will be given the first ten minutes of the laboratory. Should a student come to lab late they will not be allowed to take the quiz and will receive a zero. The quizzes will be over the material that was covered in the previous lab.

Mastering Microbiology Assignments
Students will be assigned an assignment per lecture chapter which encourages the student to read the chapter prior to lecture. The reading assignments will be due at 11:59 pm the day the material is covered. The assignments are designed to prepare the student for the material that will be covered, through a series of questions and/or diagrams.

Unknown Report
Each student will be given an unknown organism at the beginning of the semester in the laboratory. Through a series of biochemical tests, the student will identify the organism. A paper will be written on the organism, detailing the results of the biochemical tests, as well as any diseases associated with the unknown organism. **Should a student be absent for a particular test, they will not be able to perform that test on their unknown.**

Lab Worksheets
If the lab is a two part lab, students must attend both days to receive full credit on the lab worksheet. Should they miss one of the two days, the highest grade that can be earned is a 50. If the student fails to attend the lab and participate in the experiment, a zero will be given. Students will need to have instructor sign off on the lab prior to leaving.

Classroom Policies & Behavior
1. Any student who engages in distracting practices – which includes, but is not limited to, cell phone use, excessive talking, or sleeping – will be asked to leave for the remainder of the class time.

2. Closed-toe shoes and lab coat must be worn in every lab.

3. There will be absolutely no make ups for any quizzes, lecture exams, or lab practicals, as this is why there are drops for each of these.

Institutional Policies
All El Centro students are responsible for knowing and adhering to the following institutional and course-related policies:
- Institutional Policies
- Course-related Institutional Policies
- DCCCD Office of Institutional Equity Syllabi Statement
- Title IX and Sexual Misconduct
- Concealed Carry (Campus Carry)
<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture Schedule</th>
<th>Lab Schedule</th>
</tr>
</thead>
</table>
| 1 June 3 | Chapter 1: Introduction to Microbiology  
Chapter 3: Introduction to Prokaryotic Cells | Safety, Common Aseptic Transfers 1-4,  
Streak Plate 1-5  
Result 1-4, 1-5 |
| 2 June 10 | Chapter 4: Introduction to Eukaryotic Cells  
Chapter 6: Viruses and Prions | Introduction to the Light Microscope 3-1;  
Eukaryotic Organisms 3-3  
Simple Stains 3-4 |
| 3 June 17 | Exam 1 in Testing Center by June 18 (Ch 1, 3, 4, 6)  
Chapter 5: Genetics  
Chapter 7: Fundamentals of Microbial Growth | Gram-Stains 3-6  
Acid Fast Stain 3-7, Capsule Stain 3-8,  
Endospore Stain 3-9 |
| 4 June 24 | Chapter 8: Microbial Metabolism  
Chapter 9: Principles of Infectious Disease and Epidemiology | Practical 1  
Selective and Differential Media 4-3, 4-4, 4-5, 5-21 |
| 5 July 1 | Exam 2 in Testing Center by July 1 (Ch 5, 7-9)  
Chapter 10: Host-Microbe Interactions and Pathogenesis | Result 4-3, 4-4, 4-5, 5-21  
Oxidation Fermentation 5-1, Temperature 2-8  
**NO CLASS JULY 4** |
| 6 July 8 | Chapter 11: Innate Immunity  
Chapter 12: Adaptive Immunity  
Chapter 13: Immune System Disorders | Result 5-1, 2-8  
MRVP 5-3, Nitrate 5-6 |
| 7 July 15 | Exam 3 in Testing Center by July 15 (Ch 10-13)  
Chapter 14: Vaccines and Biotechnology-Based Diagnostics and Therapeutics  
Chapter 15: Antimicrobial Drugs | Result 5-3, 5-6  
Practical 2 |
| 8 July 22 | Exam 4 in Testing Center by July 22 (Ch 14-15)  
Chapter 16: Respiratory System Infections  
Chapter 17: Skin and Eye Infections  
Chapter 18: Nervous System Infections | Oxygen Requirements 2-6, 2-7, Citrate 5-7  
Result 2-6, 2-7, 5-7 |
| 9 July 29 | Exam 5 in Testing Center by July 29 (Ch 16-18)  
Chapter 19: Digestive System Infections  
Chapter 20: Urinary and Reproductive System Infections  
Chapter 21: Cardiovascular and Lymphatic System Infections | Catalase 5-4, Oxidase 5-5, Starch Hydrolysis 5-10  
Antimicrobial Susceptibility 7-2, Chemical Germicides 2-13 |
| 10 Aug 5 | Exam 6 (Ch 19-21) | Result 7-2, 2-13  
Lab Practical 3 |

*Please note, outside classwork will be required.

**Disclaimer**

The provisions contained in this syllabus do not constitute a contract between the student and El Centro College. These provisions may be changed at the discretion of the Coordinator/Instructor. When necessary, appropriate notice of such changes will be given to the student.