Eastfield College  
STEM  
Biology 2420-43005  
Microbiology for Non-Science Majors  
Spring 2019

Class Time and Location:  
Lecture: 2:00pm – 3:20pm  TR  Room C323  
Lab: 3:30pm – 5:30pm  TR  Room S300

Instructor: Estela Buenrostro  
Office Hours: by appointment only  
E-mail Address: estelabuenrostro@dcccd.edu

Course Description (4 Credit Hours): TCCNS: BIOL 2420: Microbiology for Non-Science Majors  
2014 Core Curriculum Foundational Component Area: 030 Life and Physical Sciences  
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 presented. Designed for non-science majors and allied health students. (3 Lec., 4 Lab.)  
Coordinating Board Academic Approval Number 26.0503.51 03

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.

Textbooks:  
Required:  


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

**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.

**Evaluation Procedures:**

**Exams**

- 4 Major lecture exams* – 100 points each = 400 points
- 3 Laboratory exams – 100 points each = 300 points
  A Laboratory report based on the identification of unknown bacteria – 100 points.
  Instructor evaluation of student performance including attendance – 50 points.
  A Teamwork Evaluation – 50 points per team member
  3ecampus assignments (total 100 points):
    - Microbial metabolism – 25 points
    - Microbial genetics – 25 points
    - Immunology – 50 points

**Lecture exams** are usually a combination of multiple choice and/or true/false questions. **Students are expected to supply scantrons answer forms for the lecture exams.**

*No phones or any other Smart device on the desk during exams.

**Teamwork Evaluation** - Each student will be asked to complete an evaluation that will assess the work of their team or group. That form will be submitted electronically to 3ecampus by the assigned due date and time. Submitting the evaluation form to 3ecampus will allow each student to give an open and honest evaluation of their peers. **Evaluations must be submitted and completed by the due date to 3ecampus.** Missing the deadline will cause the team member to receive a zero.

**NO ONLINE ASSIGNMENTS WILL BE RESET**

*Make – up Exams*

A comprehensive final will be given for lecture exam missed.
If a laboratory practical is missed, you will receive a grade of **ZERO** for the exam or quiz.
There are no make-up laboratory practicals. If a prelab quiz is missed, you will receive a grade of **ZERO** for that quiz. There are no make-up quizzes.
*Cheating on an exam will result in a grade of ZERO on that exam and a failing grade for the semester.

*The laboratory report based on the identification of the unknown bacteria will complete this requirement. Please do not attempt to purchase or download or copy portions of a paper from the internet, this is PLAGIARISM. If it is detected and proven that student has done so a grade of ZERO will be given on this assignment and possibly a failing final grade for the entire semester.

**Final grade**

<table>
<thead>
<tr>
<th>Points Range</th>
<th>Percentage</th>
<th>Grade</th>
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<tbody>
<tr>
<td>900 – 1000pts</td>
<td>90 – 100%</td>
<td>A</td>
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<tr>
<td>800 – 899pts</td>
<td>80 – 89%</td>
<td>B</td>
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<tr>
<td>700 – 799pts</td>
<td>70 – 79%</td>
<td>C</td>
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<tr>
<td>600 – 699pts</td>
<td>60 – 69%</td>
<td>D</td>
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<td>0 – 599pts</td>
<td>0 – 59%</td>
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**Course Outline:**

<table>
<thead>
<tr>
<th>Dates</th>
<th>Topic</th>
<th>Chapters</th>
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<tbody>
<tr>
<td>1/23</td>
<td>A Brief History of Microbiology</td>
<td>1</td>
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<tr>
<td>1/28</td>
<td>Cell Structure and Function</td>
<td>3</td>
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<tr>
<td>1/30</td>
<td>Microscopy, Staining and Classification</td>
<td>4</td>
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<tr>
<td>1/30</td>
<td>Characterizing and Classifying Prokaryotes</td>
<td>11</td>
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<tr>
<td>2/04</td>
<td>Microbial Metabolism</td>
<td>5</td>
</tr>
<tr>
<td>2/06</td>
<td>Microbial Nutrition and Growth</td>
<td>6</td>
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<tr>
<td><strong>2/10</strong></td>
<td>ECAMPUS METABOLISM ASSIGNMENT DUE</td>
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<tr>
<td>2/11</td>
<td>Microbial Genetics</td>
<td>7</td>
</tr>
<tr>
<td>2/13</td>
<td>Controlling Microbial Growth in the Environment</td>
<td>9</td>
</tr>
<tr>
<td><strong>2/17</strong></td>
<td>ECAMPUS GENETICS ASSIGNMENT DUE</td>
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<tr>
<td>2/17</td>
<td>Masteringmicrobiology Due</td>
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<tr>
<td>2/18</td>
<td>Laboratory Exam #1</td>
<td></td>
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<tr>
<td>2/20</td>
<td>Lecture Exam #1 – Chapters 1,3,6,11</td>
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2/25 Controlling Microbial Growth in the Body
2/27 Characterizing and Classifying Viruses, Viroids, and Prion
3/03 Masteringmicrobiology Due
3/04 Lecture Exam #2 – Chapters 9,10,13
3/06 Infection, Infectious Diseases, and Epidemiology
3/11 – 3/15 SPRING BREAK – NO CLASSES
3/17 Teamwork Evaluation due (submit to ecampus)
3/18 Nonspecific Lines of Defense
3/20 Specific Defense: The Immune Response
3/25 Immunization and Immune Testing
3/27 AIDS and Other Immune Disorders
3/31 ECAMPUS CHAPTERS (Immunology) 14 – 17 ASSIGNMENT DUE
4/01 Microbial Diseases of the Skin and Wounds
4/03 Microbial Diseases of the Nervous System and Eyes
4/07 UNKNOWN PAPERS DUE AT 11:30pm
4/08 Laboratory Exam #2
4/10 Microbial Cardiovascular and Systemic Diseases
4/14 Masteringmicrobiology Due
4/15 Lecture Exam #3 – Chapters 18 – 21
4/17 Microbial Diseases of the Respiratory System
4/17 LAST DAY TO WITHDRAW WITH “W”
4/22 Microbial Diseases of the Digestive System
4/24 Microbial Diseases of the Urinary and Reproductive System
4/29 Applied and Environmental Microbiology
5/01 Microbial Ecology and Microbiomes
5/05 Masteringmicrobiology Due
5/06 Laboratory Exam #3
5/13 Final Exam - Chapters 22 - 25
Attendance Policy:

- Students are required to attend all classes. Attendance is taken every class period. **IT IS THE STUDENTS RESPONSIBILITY TO RECORD THEIR NAME ON THE SIGN IN SHEETS.**
- 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.**
- A missed laboratory or lecture will result in a performance grade of **ZERO** for that class period. As you know this will have an impact on your performance grade. You will also receive a grade of **ZERO** if you attend the laboratory and do not participate in the experiments.
- Be on time, it is disruptive to other students when one is late for lecture.
- Be on time to lab, instructions are given at the beginning of lab periods. If the student misses the instructions or the entire lab, it is the students responsibility to obtain that material from your classmates.
- If you miss a lecture the student is responsible for obtaining that material from your classmates.
- **Class attendance, preparedness and participation in lecture and lab activities is used to determine the 50 points instructor evaluation grade.**

Withdrawal Policy:
If you are unable to complete this course, it is your responsibility to withdraw formally. The withdrawal request must be received in the Registrar’s Office **April 17, 2019**. Failure to do so will result in your receiving a performance grade, usually an “F.” If you drop a class or withdraw from the college before the official drop/withdrawal deadline, you will receive a “W” (Withdraw) in each class dropped. For more information about drop deadlines, refer to the current printed Credit Class Schedule, contact the Admissions/Registrar’s Office at 972-860-7167 (Room C119), or contact the division office. If you drop a class via eConnect, make sure to print a copy of the confirmation and keep the copy. In the event of a discrepancy it will be the responsibility of the student to provide documentation of having dropped the class.

Institutional Policies and Services

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


Classroom Etiquette:

- **Cellular phones** and **pagers** are to be turned **silenced** before the class starts, if you step out of class to answer a call take all of your belongings because you will not be allowed to return to class.
- **Talking** or **Texting** during lecture or during the lab instructions will cause you to be removed from the class.
• During biochemical experiments for the research paper students are expected to work independently. No one is allowed to perform staining, microscopy, inoculation or evaluation of results for your research paper. If someone in the class helps you all student participants will receive a grade of ZERO for the research paper.

*No phones or any other Smart device on the desk during exams.

The instructor reserves the right to amend this syllabus as necessary.