RICHLAND COLLEGE
BIOL 2420: Microbiology for Non-Science Majors
Course Syllabus

Semester and Year: Summer 2019
Meeting Dates:
Section: 85201
Lecture: Monday and Wednesday 7:30am – 9:30am in Wichita Hall 277
Lab: Monday and Wednesday 9:40am – 12:20pm in Sabine Hall 148

Instructor: Dr. Megan Romeo
Email: meganromeo@dcccd.edu
Phone: 972-238-6140
Office Hours: M through R 12:45pm to 2:00pm in Alamito 110, or on request

Last day to withdraw: Monday, July 22nd
Final Exam: Wednesday, August 7th at 7:30am in Wichita Hall 277

Prerequisites:
BIOL 1406 or SCIT 1407.
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;
(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.

Evaluation Procedures:
GRADE EVALUATION: Grades are determined by performance, not needs or wants. Grades will not be rounded.
A = 900 - 1000pts, B = 800 - 899.99pts, C = 700 - 799.99pts, D = 600 - 699.99pts, F = under 600

<table>
<thead>
<tr>
<th>Item</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>Lecture Exam (3 @ 100pt each)</td>
<td>300</td>
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<tr>
<td>Cumulative Final Exam</td>
<td>200</td>
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<tr>
<td>Group Microbe Presentation and write-up</td>
<td>70</td>
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<tr>
<td>Homework (4 @ 25pt each)</td>
<td>100</td>
</tr>
<tr>
<td>Lab Practical (2 @ 100pt each)</td>
<td>200</td>
</tr>
<tr>
<td>Lab quizzes (4 @ 25pt each)</td>
<td>100</td>
</tr>
<tr>
<td>Unknown Project</td>
<td>30</td>
</tr>
<tr>
<td>Total Points Earned</td>
<td>1000</td>
</tr>
</tbody>
</table>

Required Materials:
- Textbook: Microbiology with Diseases by Taxonomy, 5th edition by Robert W. Bauman
- Homework: MasteringMicrobiology (You must purchase the access code. Available in bookstore)
  - Students must print off a hard-copy of the lab exercise prior to class. Copies of the exercises are required to complete lab for the day. Printer paper is not supplied by the lab.
- Lab Materials: lab coat, safety glasses/goggles, latex/nitrile gloves

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Revised for Summer 2019
Attendance Policy:
- Attendance is required for class participation and course work; however, there is no official attendance grading policy. Missing lecture of lab will greatly affect your grade for the course.

- No make-up opportunities for missed lecture exams. Lecture exams may only be re-scheduled if the student contacts the instructor 48 hours prior to the scheduled exam time.
  - If you are ill, you must contact the instructor immediately. You will need to provide a doctor’s note specifying that you were unable to attend the exam at that date and time.
  - In case of illness/re-scheduled exams, you may not receive an identical exam to the rest of the class.

- Lab quizzes will be given during the first 20 minutes of lab. You will not have additional time if you show up late.

- No make-up lab practicals will be given. If you cannot attend your own section’s scheduled lab practical, you will need to attend another lab period during the lab practical time period.

- You are expected to be in lab every period. Missing lab will definitely affect your lab practical grade. If you must miss lab, I can give you the lab times for other sections, but you need to introduce yourself to that instructor and ask if it would be alright to attend their lab.

- If the student feels that they will be unable to complete the required coursework, it is the student’s responsibility to withdraw formally from the course. Failure to drop or withdraw will result in receiving a performance grade, usually an “F.”

Instructor Policies and Suggestions for Success:
- Cell phones, smart watches, and tablets are banned from your person/desk during exams, quizzes, and practicals.

- Electronics:
  - Laptops/tablets are allowed in lecture to take notes; they must be muted.

- Cell phones:
  - Lecture – if you need to answer your cell phone, please do so in the hallway and exit the classroom and quietly as possible.
  - Lab – Banned from the work area. They must remain in your bag during lab.

- Food and drink:
  - Lecture – allowed in the lecture. Try to not bring anything too noisy or aromatic.
  - Lab – absolutely no food or drink. Any food/drink items must remain in your bag or just outside of the lab door.

- This class requires group interaction both in lab and lecture. You will perform in-class activities as small groups and cooperate as lab partners. You must be prepared to be an active independent learner as well as a cooperative group member.

- You should be prepared to study for at least one hour outside of class for every hour you are inside of class each week.

- You are expected to behave in an adult manner while in lecture and lab. Inappropriate behaviors include sleeping, working on non-Microbiology materials, excessive chatter in lecture, and cheating.

Academic Honesty
Scholastic dishonesty is a violation of the Code of Student Conduct. Dishonesty includes cheating on exams, plagiarism, etc. Violations will result in a grade of zero. Enrollment in a DCCCD course indicates acceptance of the Code of Student Conduct: [http://www.richlandcollege.edu/conduct](http://www.richlandcollege.edu/conduct).

Disability Services/Special Services
Students with a disability and/or special needs that require ADA accommodations should contact the Richland College Disability Services Offices at T120 or (972) 238-6180.

Religious Holidays
Religious holidays are excused absences. The student must contact the instructor prior to the day of religious observance to schedule make-up work, exams, etc.

College Policies and Procedures
Instructor reserves the right to make necessary changes to the syllabus.
Revised for Summer 2019
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Revised for Summer 2019

Institutional policies can be accessed via the following link: www.richlandcollege.edu/syllabipolicies

Richland College’s Quality Enhancement Plan ~ Learning to Learn: Developing Learning Power
Richland College is piloting its Quality Enhancement Plan in select classes. The QEP provides techniques, practices, and tools to help students develop the habits, traits or behaviors needed to be effective and successful lifelong learners in college and in life. For more information, please check QEP 2013 (http://www.richlandcollege.edu/admissions.process.php)

General Course Information
Course Catalog Description:
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. (4 credit hours: 3 Lec., 4 Lab.)

Course Objectives:
Students will be able to describe the morphology, physiology, and taxonomy of representative groups of pathogenic and non-pathogenic organisms, and apply techniques used in growing pure cultures as it relates to humans and public health issues.

Course Description and Learning Outcomes
This course covers basic microbiology and immunology and is primarily directed at pre-nursing, pre-allied health, and non-science majors. It provides an introduction to historical concepts of the nature of microorganisms, microbial diversity, the importance of microorganisms and acellular agents in the biosphere, and their roles in human and animal diseases. Major topics include bacterial structure as well as growth, physiology, genetics, and biochemistry of microorganisms. Emphasis is on medical microbiology, infectious diseases, and public health.

The lab part of this course covers basics of culture and identification of bacteria and microbial ecology. This course is primarily directed at pre-nursing and other pre-allied health majors and covers basics of microbiology.

Upon successful completion of this course lecture part, 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.

Upon successful completion of this course lab part, students will:
1. Use and comply with laboratory safety rules, procedures, and universal precautions.
2. Demonstrate proficient use of a compound light microscope.
3. Describe and prepare widely used stains and wet mounts, and discuss their significance in identification of microorganisms.
4. Perform basic microbiology procedures using aseptic techniques for transfer, isolation and observation of commonly encountered, clinically significant bacteria.
5. Use different types of bacterial culture media to grow, isolate, and identify microorganisms.
6. Perform basic bacterial identification procedures using biochemical tests.
7. Estimate the number of microorganisms in a sample using methods such as direct counts, viable plate counts, or spectrophotometric measurements.
8. Demonstrate basic identification protocols based on microscopic morphology of some common fungi and parasites.
Core Curriculum Statement
The objective of the study of a natural sciences component of a core curriculum is to enable the student to understand, construct, and evaluate relationships in the natural sciences, and to enable the student to understand the bases for building and testing theories.

Intellectual Competencies:
- Reading – the ability to analyze and interpret a variety of printed materials above 12th grade level
- Writing – the ability to produce clear, correct, and coherent prose adapted to purpose, occasion, and audience – above a 12th grade level
- Speaking – the ability to communicate orally in clear, coherent, and persuasive language appropriate to purpose, occasion, and audience – above a 12th grade level
- Listening – the ability to analyze and interpret various forms of spoken communication, possess sufficient literacy skills of writing and reading – above 12th grade level
- Critical Thinking – to think and analyze at a critical level
- Computer Literacy - to understand our technical society, use computer-based technology in communication, solving problems, and acquiring information
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<thead>
<tr>
<th>Week of</th>
<th>Lecture</th>
<th>Date</th>
<th>Lab</th>
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<tbody>
<tr>
<td>June 7</td>
<td>Ch 1 – History</td>
<td>F</td>
<td>Introduction, Lab Safety and Check-in, Mock epidemic, Ubiquity of Bacteria</td>
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<tr>
<td>June 10</td>
<td>Ch 3 – Cell Structure and Function (focus on prokaryotes, self-study eukaryotes)</td>
<td>M</td>
<td>Transfer of Bacteria, Pure culture techniques, Microscopy and Simple Staining, Preparation of Specimens</td>
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<td>Ch 4 – Microscopy and Specimen Preparation</td>
<td>W</td>
<td>Gram staining, Spore Staining, Acid-fast staining</td>
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<td>June 17</td>
<td>Ch 5 – Metabolism</td>
<td>M</td>
<td>Motility tests, Capsule stain, Dilution and Pipetting</td>
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<td>Ch 6 Nutrition and Growth</td>
<td>W</td>
<td>Counting Bacteria, Colony morphology</td>
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<td>Exam I (Ch 1, 3, 4, 5)</td>
<td>F</td>
<td>Ch 7 Microbial Genetics (selected topics)</td>
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<td>June 24</td>
<td>Ch 9 – Control of Microbial Growth in the Environment</td>
<td>M</td>
<td>Environmental Conditions and Growth, Effect of Temperature</td>
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<td>Ch 10 – Controlling Microbial Growth in the Body</td>
<td>W</td>
<td>Lab Quiz #2</td>
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<tr>
<td>Jul 1</td>
<td>Ch 14 – Epidemiology</td>
<td>M</td>
<td>Surgical Handscrub, Protozoa, Fungi</td>
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<td></td>
<td>Ch 11, 12 - Classifying Prokaryotes and Eukaryotes</td>
<td>W</td>
<td>Lab Practical I</td>
</tr>
<tr>
<td>Jul 8</td>
<td>Exam II (6, 7, 9, 10, 14)</td>
<td>M</td>
<td>Unknown Bacteria: Gram stain, Streak TSA for morphology, oxygen requirement, oxidase, catalase</td>
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<tr>
<td></td>
<td>Homework 2 due</td>
<td>W</td>
<td>Unknown ID 2 and 3: IMViC, TTC motility, Carbohydrate utilization, Nitrate Reduction, Decarboxylation and Deamination, Gelatin hydrolysis</td>
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<td>Continued Ch 11, 12</td>
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<td>Ch 13 – Classifying Viruses</td>
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<td>Jul 15</td>
<td>Ch 19-21 – Selected pathogenic bacteria</td>
<td>M</td>
<td>Lab Quiz #3</td>
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<td>Ch 22-23 – Selected pathogenic fungi, protozoa, helminths</td>
<td>W</td>
<td>Unknown ID 4: Urea, starch, lipid, and skim milk hydrolysis, additional tests Staph and Step ID 1</td>
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<td>Staph and Strep ID 2, Bacteriophages</td>
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<tr>
<td>Jul 22</td>
<td>Ch 24-25 – Selected DNA and RNA viruses</td>
<td>M</td>
<td>Lab Quiz #4</td>
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<td>Ch 15 – Innate Immunity</td>
<td>W</td>
<td>Staph and Strep 4, Urine culture, Ectoparasites</td>
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<td>Homework 3 due</td>
<td>W</td>
<td>Lab Clean up and Check out</td>
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<td>Ch 16 – Adaptive Immunity</td>
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<td>Lab Practical II</td>
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<tr>
<td>Aug 5</td>
<td>Ch 17/18– Immunizations, Disorders, Testing</td>
<td>M</td>
<td>Disease Presentation</td>
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<td></td>
<td>Homework 4 due</td>
<td>W</td>
<td>No lab</td>
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<td>Final Exam (Ch 15, 16, 17/18 +Cumulative)</td>
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