RICHLAND COLLEGE
BIOL 2421: Microbiology for Science Majors
Course Syllabus

General Course Information
Course title: Microbiology for Science Majors
Course number/section: BIOL 2421-85202
Course description: Principles of microbiology, including metabolism, structure, function, genetics, and phylogeny of microbes. The course will also examine the interactions of microbes with each other, hosts, and the environment.
Pre-requisites Required: BIOL 1406, BIOL 1407 and CHEM 1411. Student cannot take both BIOL 2420 and BIOL 2421 to satisfy the core science credit.
Credit hours: 6 credit hours (3 Lec., 4 Lab.)
Location and times:
- Lecture: Tuesday and Thursday 7:30am – 9:30am in Wichita Hall 277
- Lab: Tuesday and Thursday 9:40am – 12:20pm in Sabine Hall 146
Drop Date: Monday, July 22nd
Final Exam: Thursday, August 8th at 7:30am in Wichita Hall 277

Instructor Information
Instructor: Dr. Megan Romeo, Microbiology Adjunct
E-mail address: meganromeo@dcccd.edu
Telephone: 972-238-6140
Office hours: Monday through Thursday 12:45pm to 2:00pm, or on request
Office: Alamito 110

Evaluation Procedures:
A = 900-1000pts; B = 800-899.99 pts; C = 700-799.99 pts, D = 600-699.99 pts, F = under 600pts
Grades will not be rounded.

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture Exam (3 @ 100pt each)</td>
<td>300</td>
</tr>
<tr>
<td>Cumulative Final Exam</td>
<td>200</td>
</tr>
<tr>
<td>Group Microbe Presentation</td>
<td>50</td>
</tr>
<tr>
<td>Disease Report</td>
<td>50</td>
</tr>
<tr>
<td>In-class or lab activities</td>
<td>50</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>50</td>
</tr>
<tr>
<td>Total Points Earned</td>
<td>1000</td>
</tr>
</tbody>
</table>

Required Materials:
  - 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
- Optional: *Photographic Atlas for Microbiology* by Leboffe (Morton Publishing)

Instructor reserves the right to make necessary changes to the syllabus.
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.

- No make-up opportunities for missed in-class activities. We will work through case studies and worksheet throughout the semester as small groups in lecture. If you are absent for class, you will miss these points.

- 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).

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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
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:
Principles of microbiology, including metabolism, structure, function, genetics, and phylogeny of microbes. The course will also examine the interactions of microbes with each other, hosts, and the environment. Designed for students in science or pre-professional programs. (4 credit hours: 3 Lec., 4 Lab.)

Course Objectives:
A study of the morphology, physiology, and taxonomy of representative groups of pathogenic and non-pathogenic organisms. Emphasis is placed on the relationships that influence humans: public health, infectious diseases, and immunology, biotechnology, and environmental and industrial applications. Lab experimentation with pure cultures and selected media will be used to study extensively the medical, environmental, and industrial importance of these microbes. Designed for students in science or pre-professional programs.

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

Core Curriculum Intellectual Competencies
READING: the ability to analyze and interpret a variety of printed materials - books, documents, and articles - above 12th grade level.
WRITING: the ability to produce clear, correct and coherent prose adapted to purpose, occasion and audience - above 12th grade level.
CRITICAL THINKING: think and analyze at a critical level.
COMPUTER LITERACY: understand our technological society, use computer based technology in communication, solving problems, acquiring information.

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Core Curriculum Statement
Through the Texas Core Curriculum, students 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 for the Sciences
- Critical Thinking Skills - to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
- Communication Skills - 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.
<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture Topic</th>
<th>Date</th>
<th>Lab Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 6</td>
<td>The Microbial World (Ch 1)</td>
<td>R</td>
<td>Rules, safety, and check-in, 14,15- Use of the Microscope/Bacterial smears</td>
</tr>
<tr>
<td>June 11</td>
<td>Microbial Cell Structure and Function (Ch 2) Focus on Prokaryotes; self-study Eukaryotes</td>
<td>T</td>
<td>1- Media Preparation, 2-Aseptic transfers of Bacteria, 8 – Bacterial Colony Morphology</td>
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<td></td>
<td>Microbial Metabolism and its Diversity (Ch 3, 14)</td>
<td>R</td>
<td>16 – Hanging drop wet mount, 21 – Flagella stain, 5 – Bacteria isolates from sponge <em>(kitchen sponge needed)</em></td>
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<tr>
<td></td>
<td>Microbial Metabolism continued</td>
<td>F</td>
<td>Extra lecture in lab (Finish Ch 3/14; start Ch 5)</td>
</tr>
<tr>
<td>June 18</td>
<td>Exam I</td>
<td>T</td>
<td>18-Gram stain (isolate from sponge plates), 20-Acid-fast stain, 19-Spore stain, 22-Capsule stain</td>
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<tr>
<td></td>
<td>Microbial Growth and Control (Ch 5)</td>
<td>R</td>
<td>Lab Quiz #1 3, 4 – Dilutions, 7 – Isolation of Antibiotic producer from the soil (1) <em>(soil needed)</em>, 49 – Fungi</td>
</tr>
<tr>
<td>June 25</td>
<td>Clinical Microbiology and Antibiotics (Ch 28) Genetics (Ch 11)</td>
<td>T</td>
<td>11- Bacterial numbers, 7 – Soil (2)</td>
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<td></td>
<td></td>
<td>F</td>
<td>Lab Quiz #2; graph check 46 – Water Analysis, 47 - Mead Staph ID (2): 31 – Coagulase, 44 – Beta-galactosidase (ONPG)</td>
</tr>
<tr>
<td>July 2</td>
<td>Exam II (Ch 5, 11, 28, 24, 25)</td>
<td>T</td>
<td>Finish Staph ID; 9 – Antibiotic Sensitivity (Kirby-Bauer); 10 – Antimicrobials; 50 – Protozoa; 53 – Algae</td>
</tr>
<tr>
<td></td>
<td>JULY 4 IS A HOLIDAY</td>
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<tr>
<td>July 9</td>
<td>Epidemiology (Ch 29)</td>
<td>T</td>
<td>Lab Practical I</td>
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<tr>
<td></td>
<td>Diversity and Phylogeny of Bacteria (Ch 15, 16)</td>
<td>R</td>
<td>Unknown Project: Gram stain; streak TSA; 6 – Oxygen requirements; 35 – Carbohydrate use 52 - Helminths</td>
</tr>
<tr>
<td>July 16</td>
<td>Diversity of Microbial Eukarya (Ch 18)</td>
<td>T</td>
<td>37 – IMViC; 38 – TTC motility; 39 – Gelatin hydrolysis; 40 – Carboxylation of amino acids; 41 – Deamination of amino acids; 42 – Nitrate reduction; streak plate check; gram stain check</td>
</tr>
<tr>
<td></td>
<td>Viruses and Viral Genomics (Ch 8, 10)</td>
<td>R</td>
<td>Lab Quiz #3 25 – OF glucose; 28-30 – Starch, lipid, casein hydrolysis; 34 – urea hydrolysis 48 – Yogurt</td>
</tr>
<tr>
<td>July 23</td>
<td>Exam III</td>
<td>T</td>
<td>Unknown due 45 – API-20E (two strips per class); 12 – oral biofilms <em>(toothbrush needed)</em>; 13 – urine culture</td>
</tr>
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<td></td>
<td>Selected Microbial Diseases (Ch 30-33)</td>
<td>R</td>
<td>51 – Bacteriophages</td>
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<tr>
<td>July 30</td>
<td>Biotechnology (Ch 12)</td>
<td>T</td>
<td>54 – DNA Restriction and electrophoresis; 55 – Serology (DEMO)</td>
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<td></td>
<td>Immunology (Ch 26, 27)</td>
<td>R</td>
<td>Lab Quiz #4 Disease Presentations; Lab Cleanup and Checkout</td>
</tr>
<tr>
<td>August 6</td>
<td>Vaccines and Serology (Ch 28)</td>
<td>T</td>
<td>Lab Practical II</td>
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<tr>
<td></td>
<td>Disease Presentation Report due</td>
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<tr>
<td></td>
<td>Final Exam (Ch 12, 26, 27, 28, 30-33 + cumulative)</td>
<td>R</td>
<td>No lab</td>
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</tbody>
</table>

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