

BIOL 2421: Microbiology for Science Majors

CLARENDON COLLEGE
Division of Science and Health
Course Syllabus
Spring 2011

Lecture: **BIOL 2421.231 Thursday** 5:00pm – 7:00pm MKBC 101

Lab: **BIOL 2421L.221 Thursday** 3:00pm – 4:50pm MKBC 202

BIOL 2421L.231 Thursday 7:05pm – 9:30pm MKBC 202

4 Semester Credit Hours

Instructor: Mr. Russell Estlack

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Office Hours: Monday, Wednesday, & Friday 9:00am – 11:00am Pampa

Tuesday 4:00pm – 5:00pm Pampa

Friday 1:00pm – 3:00pm Clarendon

Other office hours by appointment.

Course Description: This course is an introduction to the fundamental principles of microbiology. Lecture material treats taxonomy, life requirements, reproduction, growth, death, genetics, metabolism, & control of microorganisms. Laboratory involves techniques employed in the proper handling & identification of both pathogenic and non-pathogenic forms.

Statement of Purpose: Microbiology for Science Majors partially satisfies the requirements for the Associates Degree at Clarendon College and is designed for transfer to a senior college.

Required Texts: *Microbiology: A Human Perspective* 6th edition by Nester et al.

Class lectures will be based on the book chapters, but not all of the material in the text will be covered in class. **You are, nevertheless, responsible for reading the text.** Further, supplemental material may be presented that is not in the book, and thus it is essential that you attend the class regularly.

Supplies: Textbook, 3 ring binder, scantrons, Sharpie pen, lab coat, paper towels, and pencils.

Methods of Instruction: This course will utilize lecture/discussion, audio-visual materials, and individualized lab instruction.

Exemplary Course Objectives: Successful completion of Microbiology should enable the student to...

- Understand and apply methods and appropriate technology to the study of natural sciences.
- Recognize scientific and quantitative methods and the differences between these approaches and other methods of inquiry and to communicate findings, analyses, and interpretation both orally and in writing.
- Identify and recognize the differences among competing scientific theories.
- Demonstrate knowledge of the major issues and problems facing modern science, including issues that touch upon ethics, values, and public policies.
- Demonstrate knowledge of the interdependence of science and technology and their influence on, and contribution to, modern culture.

Student Learning Outcomes: Upon successful completion of Microbiology, the student should be able to...

- Examine bacterial culture slides using compound light microscopes.
- Manage bacterial cultures utilizing correct aseptic and culturing techniques.
- Assess bacterial cultures using standard microbial staining techniques (Gram, negative, capsule, etc.).
- Conduct experiments to determine the efficacy of various standard practices to control bacterial populations.
- Evaluate the ethical issues, costs, and benefits of antibiotic and other antimicrobial product.

- Comprehend the dynamic nature of microbial life & appreciate what this branch of study has to offer other sciences.
- Relate the importance of microbes to humans and human cultures.
- Discuss microbial growth, metabolism, and genetics.
- Discuss the nonspecific and specific immune systems of humans.
- Apply knowledge of food and water microbiology to decrease transmission of bacterial diseases.

Grading Policies: You will receive one letter grade for BIOL 2421. That grade comes from four components: class participation, your lecture notebook, lecture exams, and a laboratory grade.

1. **Class participation will count as 10%** of your final course grade.
 - a. This grade comes from your participation in class discussions and exercises.
 - i. If you choose not to participate in class discussions, you will receive no credit.
 - b. For every three unexcused absences (either to lecture or lab) you will have 10 points deducted from your class participation grade.
 - i. If you leave during class, you will receive an unexcused absence.
 - ii. If you arrive late to class, you will receive an unexcused absence.
 - iii. If you are asked to leave class due to disrespectful behavior, you will receive an unexcused absence.
2. **Your Lecture Notebook will count as 10%** of your final course grade.
 - a. Lecture notes (that are to be completed during class) are posted online.
 - b. You should print these notes and come to class with them in your 3 ring binder.
 - c. Your notebook should also include any lecture and/or lab handouts.
 - d. *Your notebook will be graded during your lab final.* It will be graded on the following criteria...
 - i. Completeness
 - ii. Neatness
 - e. A grading rubric (checklist) is posted in CAMs for your use.
3. **Lecture exams will count as 55%** of your final course grade.
 - a. Students will not be allowed to take exams until they have signed a course contract.
 - b. All lecture tests, including the final, will be weighted equally.
 - c. Each test covers the material covered since the last test (not comprehensive).
 - d. The tests will utilize a variety of question formats (objective, matching, multiple choice, true/false, etc.)
 - e. I will drop your lowest lecture test grade, excluding the final which must be counted.
 - f. You will take these exams on a **scantron, form no.882-E** (the long skinny one with 50 questions on each side).
 - i. These scantrons are on sale in the bookstore and in the office.
 - ii. These exams **MUST** be taken in PENCIL.
 - g. During the exams, electronic communication devices are NOT allowed, and both hands **MUST** remain on the desktop, in clear view.
4. **Lab quizzes will count as 15%** of your final course grade.
 - a. Short quizzes will be given each week during the first 15 minutes of lab.
 - b. If you come too late to lab, you will receive a zero on that quiz.
 - c. The weekly quizzes will cover the material from the previous lab.
 - d. I will drop your lowest lab quiz grade at the end of the semester.
5. **Lab practicals will count as 10%** of your final course grade.
 - a. You will take a midterm practical exam and a final practical exam in lab.
 - b. The average of those two grades will be 10% of your final course grade.

Grading Scale for the course:

89.5% - 100%	A
79.5% - 89.4%	B
69.5% - 79.4%	C
59.5% - 69.4%	D
59.4% and below	F

Academic Integrity: An Excerpt from Clarendon College's Student Handbook

Failure to comply with lawful direction of a classroom instructor is a disruption for all students enrolled in the class. Cheating violations include, but are not limited to: (1) obtaining an examination, classroom activity, or laboratory exercise by stealing or collusion; (2) discovering the content of an examination, classroom activity, laboratory exercise, or homework assignment before it is given; (3) using an unauthorized source of information during an examination, classroom activity, laboratory exercise, or homework assignment; (4) entering an office or building to obtain unfair advantage; (5) taking an examination for another person; (6) completing a classroom activity, laboratory exercise, homework assignment, or research paper for another person; (7) altering grade records; (8) using any unauthorized form of electronic communication device during an examination, classroom activity, or laboratory exercise; (9) Plagiarism. Plagiarism is the using, stating, offering, or reporting as one's own, an idea, expression, or production of another person without proper credit.

Disciplinary actions for cheating in a course are at the discretion of the individual instructor. The instructor of that course will file a report with the Dean of Students when a student is caught cheating in the course, whether it be a workforce or academic course. The report shall include the course, instructor, student's name, and the type of cheating involved.

Students who are reported as cheating to the Dean of Students more than once shall be disciplined by the Dean. The Dean will notify all involved parties within fourteen days of any action taken.

Classroom Conduct

I will show you the respect you deserve as a student. I, in return, expect respectful behavior from you. Because the following actions cause disruption in the classroom and therefore affect the ability of students to learn, I have strict policies concerning them. Disrespectful behavior on your part will result in deductions from your class participation grade.

Disrespectful behavior includes...

- **Arriving late.**
- **Leaving the room during class time.** Plan restroom visits before or after class—not during class. If special needs exist, please make prior arrangements.
- **Using electronic communication devices.** This includes cell phones, pagers, etc. These are not allowed during class time. If special needs exist, please make prior arrangements.
- **Sleeping in class.**
- **Talking in class.** Class time is not the time to visit with your fellow classmates. If you do, I will ask you to leave the classroom.
- **Using headphones.** If you do, I will ask you to leave the classroom.
- **I do NOT allow abusive, obscene, or offensive clothing, jokes, or behavior.**

Class Policies:

1. **Absences:** Please take class attendance seriously. You are here to learn all you can learn, to build a body of knowledge to help you in your career and/or to give you satisfaction in the future. Students who are motivated come to class. **You are responsible for the material covered in class (lecture or lab) even if you are absent.** *Unexcused absences will count against your class participation grade as discussed in the grading policies.*
2. **Excused absences:** Make-ups for tests will be allowed *only* if absences are excused. Excused absences can result from...
 1. illness on the part of the student
 2. severe illness or death in your *immediate* (not extended) family
 3. college sanctioned extracurricular events
 4. unfavorable weather conditions that prevent students from reaching the collegeIf you wish for your absence to be excused, you should telephone or e-mail me *in advance* of the absence (leave a message if necessary). Even in emergencies, it usually is possible for you to get word to me about an absence. When you return, you must furnish proof of the reason for your absence if you wish for it to be excused.
3. **Make-up work:** Late or unexcused work will not be accepted. Students who have excused absences **MUST** let me know **before** the test is given that we need to schedule a make-up. In most cases, the tests must be taken **PRIOR** to the absence in order to receive full credit. ****If you take the test after it has been given to the class, you will receive a 10% penalty per school day that passes until you take the make-up.**** To avoid the penalty, **MAKE SURE YOU TAKE A MAKE-UP TEST BEFORE YOU LEAVE.**

4. **There will be NO make-up lab midterm or final.** Because these tests involve practical sections, they can't be set up time & again. If you miss one of these tests, you will have to take a significantly harder essay test. The take home message is: **PLAN TO ATTEND THESE TWO DAYS!**
5. **Final Exams:** Students must take a final for each of their academic courses. The schedule of final exam times is published at the beginning of the semester. Do not make plans to leave school before your scheduled final exam. I will not give any early finals except in extreme emergencies after students have provided documentation of said emergency.
6. **Scholastic Honesty:** I adhere to a strict policy regarding academic honesty. Anyone who is dishonest in any way will receive a zero on that assignment or exam with no opportunity to make up the zero and may be dropped from the course with a grade of F. That student, if allowed to remain in the course, will not be allowed to receive any extra credit points from the time of the infraction through the remainder of the course. A second act of dishonesty will result in an F for the course. Note that dishonest behavior includes both the act of copying someone else's work as well as allowing someone to copy your work. Both students are equally guilty and will be equally punished.
7. **Electronic Communication/Entertainment Devices/Laptops:** Below is an excerpt from Clarendon College Policy 1541.

...Cell phones, pagers, and other personal electronic devices must be off and out of sight in classrooms, laboratories, the library, study spaces, and other academic settings and during such events as plays, concerts, lectures, and College ceremonies...These electronic devices may be turned on and set on silent mode only with the expressed consent of the instructor...faculty members may have individual policies related to cell phones, pagers, and other personal electronic devices outlined in their syllabi...(that) may include penalties for violation...

The use of cell phones, iPods, other electronic communication or entertainment devices, or laptops is prohibited unless you have made prior arrangements with the instructor. An offense will result in the device being taken up.

8. **Accommodations:** Clarendon College provides reasonable accommodations for persons with temporary or permanent disabilities. Should you require special accommodations, it is your responsibility to notify the Office of Student Services (806-874-3571 or 800-687-9737). We will then work with you to make whatever accommodations we need to make.
9. **Withdrawal:** If you decide that you are unable to complete this course or that it will be impossible to complete the course with a passing grade, you may drop the course and receive a "W" on your transcript instead. Withdrawal from a course is a formal procedure that you must initiate. If you do not go through the formal withdrawal procedure, you will receive a grade of "F" on your transcript. A student is permitted to drop a course if he/she obtains an official drop slip from the office and has the instructor sign the slip before the 12th class week.

Remember, a student is only allowed to drop the same class twice before he/she will be charged up to triple the tuition amount for taking the class a third time or more. Furthermore, beginning with the Fall 2007 semester, students in Texas may only drop a total of 6 courses throughout their entire undergraduate career. After the 6, he/she will no longer be able to withdraw from any classes.

If you think you need to drop this course, please talk with me about it first. It is possible that there is something you can do to still pass the course. Don't hurt your chances for a passing grade in the course by not attending labs or taking exams before we have discussed your situation.

The last day to withdraw from this course with a "W" is Friday, April 15, 2011.

Extra Credit: There will be various opportunities to earn extra credit during the semester through challenge trivia. PLEASE NOTE: THESE ARE WRITING (not printing/copying) EXERCISES.

1. Challenge trivia questions are assigned from questions asked by students during lecture.
2. Your answers to these questions are to be neatly written or typed, using correct grammar and complete sentences. You may use either library resources (the internet and library books) or your textbook to answer these questions.
3. You must cite your source (web address or book and page number) at the end of your answer.
4. Challenge trivia questions will add 3 to 5 points (depending on neatness, grammar, and difficulty) to your next lecture exam, and are due immediately before you take your lecture exam.
5. You are expected to do your own work. Students with identical answers will receive no credit for their work. Neither will be allowed to receive any extra credit points from the time of the infraction through the remainder of the course. No credit will be given for answers that are simply printed/copied and highlighted.

Microbiology for Science Majors: Course Calendar and Outline

The essence of life is change and so too this syllabus. As situations in the classroom and laboratory arise, modifications may have to be made, particularly regarding the course calendar. All attempts will be made to keep these changes to a minimum.

DAY OF	LECTURE TOPICS	LAB ACTIVITIES
Jan 20	Syllabus, Course Contract, and Introduction to CAMs Ch 1: Humans & the Microbial World	No lab
Jan 27	NO Class – TCCTA Convention	No lab
Feb 3	Ch 3: Microscopy & Cell Structure	Lab Safety & Protocol Ex 1: Brightfield Microscopy
Feb 10	EXAM I	Ex 8: Aseptic Technique Ex 6: The Ubiquity of Bacteria
Feb 17	Ch 4: Dynamics of Prokaryotic Growth	Ex 10: Smear Preparation Ex 11: Simple Staining Ex 12: Negative Staining
Feb 24	Ch 5: Control of Microbial Growth	Ex 14: Gram Staining
Mar 3	EXAM II	Ex 9: Pure Culture Techniques Practice Gram Staining Review for Lab Midterm
Mar 10	Ch 6: Metabolism: Fueling Cell Growth	Lab Midterm
Mar 17	SPRING BREAK	No lab
Mar 24	EXAM III	Ex 20: Enumeration of Bacteria: The Standard Plate Count Ex 26: Temperature: Effects on Growth Ex 27: Temperature: Lethal Effects Ex 28: pH and Microbial Growth Ex 29: Water Activity and Osmotic Pressure
Mar 31	Video: <i>DNA: The Secret of Life</i> Ch 7: The Blueprint of Life, from DNA to protein Ch 8: Bacterial Genetics Microbiology T-shirt Contest	Ex 30: Ultraviolet Light: Lethal Effects Ex 32: Evaluation of Alcohol: Its Effectiveness as an Antiseptic Ex 35: Effectiveness of Hand Scrubbing
Apr 7	EXAM IV	Ex 36: Morphological Study of Unknown Bacterium Ex 37: Cultural Characteristics Ex 47: Bacteriological Examination of Water: Qualitative Tests
Apr 14	Ch 15: The Innate Immune Response Ch 16: The Adaptive Immune Response <i>Fri., Apr. 15 – last day to drop with a "W"</i>	Supplemental: Plate Counts of Milk Ex 46: Bacterial Counts of Foods
Apr 21	Ch 17: only Immunization pgs. 414-420 Ch 19: Host-Microbe Interactions My Favorite Bacteria Assignment	Results from previous week Lab clean up Video: <i>Ebola: The Plague Fighters</i> Review for Lab Final
Apr 28	Ch 20: Epidemiology	Lab Final Exam **Bring your lecture notebook for grading!**
May 5	FINAL EXAM : Thursday at 5:00pm	