

Biology 31 (BIOL 31) Microbiology

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| <i>Semester: Spring 2018</i> | <i>Reedley Community College</i> |
| Instructor: Andrew Strankman | <i>Class No. 50024</i> |
| Email: andrew.strankman@reedleycollege.edu | Lecture Times: Tu/Th: 5:15-6:30PM |
| Phone: 559-638-0300 ext. 3499 | Lab Times: Tu/Th: 6:45PM-9:35PM LFS-6 |
| Office: LFS 10 | |
| Office Hours: Tu: 4:15-5:15PM Th: 2:15-3:15PM F: 8:00-9:00am (Digital) | |
| <i>Date: 01/08/18 - 05/18/18</i> | |

Catalog Description: Microbiology, 5 units, 3 hours lecture, 6 hours lab, including classification, morphology, identification, and physiology of microorganisms. May include a field trip.

Prerequisites: Successful completion of Biology 1 or Biology 5 and Chemistry 1A or 3A. Recommended: Successful completion of Biology 20 and Biology 22.

Objectives:

- A. To have a basic understanding of microbes as living organisms.
- B. To become familiar with laboratory techniques necessary to work with microorganisms.
- C. To understand and practice aseptic techniques.
- D. To become familiar with microbial morphology, classification, and identification.
- E. To understand the role of microorganisms in health and disease and the mechanisms used to control microbial populations.

REQUIRED MATERIALS

- A. Tortora, Gerard J. et al., Microbiology, 11th Edition, 2012. Benjamin Cummings Publishing Company
- B. Symbiosis for Reedley College. Latest Edition. Benjamin Cummings Publishing Company. This is a custom lab manual and can only be purchased at Reedley College. Rentable lab manuals are not accepted.
- C. Scantron #886 miniblue books (x7)

Other REQUIRED materials:

- A. White Laboratory Coat (will be worn at all times during lab)
- B. Clean short fingernails, no fingernail polish or acrylic nail covers (ENTIRE COURSE DURATION)

Student Projects:

- A. Students will be required to complete a reading assignment. Specific details will be given to you in a separate hand out.
- B. A research paper on a subject in Microbiology, chosen by the student, will be required. Specific details will be given to you in a separate hand out. A computer assignment will be required.

NO FOOD, BEVERAGES, CELLULAR PHONES, PAGERS, OR PROFANITY AT ANY TIME!

If you or your electronics become a disturbance to the class, points will be deducted from your scores on assignments and you may be asked to leave.

ATTENDANCE AND DROP/ADD POLICY

- A. You are required to attend **ALL** class sessions. There are **NO** excused absences except as defined in the Reedley College Catalog.
- B. If you are absent more than **TEN** hours before the ninth week of class during the semester, you **MAY** be dropped from the class. If you miss more than **TEN** hours of class after the last day to

drop, your final grade will be lowered by one **LETTER GRADE**. If you miss more than **TWENTY** hours of class time, your final grade will be lowered by two **LETTER GRADES**.

I will drop students (both enrolled and waitlisted) based on the following policy:

1. Student does not attend the first lecture.
 2. Student does not attend the first lab.
 3. Student misses a cumulative 3 hours (lecture or lab) in the first week.
 4. Student misses a cumulative 4 hours (lecture or lab) in the first three weeks.
- C. Plan your schedule so that you will arrive to class on time. This is particularly important with regards to the lab as explanations and directions are given in the first 30 minutes. You are required to read the lab exercises before the lab period in which it is to be performed.
- D. No formal break period is scheduled during the lab period. If it is necessary to leave, you must leave your lab coat in the lab, wash and dry your hands, and fit this short break in to the lab work schedule so all work is completed during the allotted time.
- E. If you should decide to drop this course for any reason, it is your responsibility to make the drop official. The drop deadline for this semester is_____. It is YOUR responsibility to make any drop official. Failure to officially drop a course could result in the administering of an “F” grade.

LATE ADD POLICY

Adds to the class will begin with waitlisted students. However, if you do not attend the class, your place on the waitlist will be disregarded. I will **ONLY ADD STUDENTS TO THE CLASS WHO HAVE BEEN ATTENDING THE CLASS SINCE THE FIRST MEETING** (unless a verifiable extenuating circumstance exists, as determined by me).

If you do not use an add code provided by your instructor within 48hrs, your place in the course will be forfeit.

LATE ASSIGNMENTS, CHEATING, AND MAKE-UP POLICY

Late assignments will not be accepted. **After one week any missed grade may not be made up** unless prior written arrangements have been made. This is to ensure fairness both to the other students and to me.

- A. Tests cannot be made up unless arrangement is made prior to the exam or under extenuating circumstances with prior arrangement.
- B. If you plan on missing this class for 2 or more days, it may affect your overall grade and is not recommended. Do not plan on missing a week or more of this class as your grade may be lowered one letter grade.
- C. If you are late please report your tardy at the first break or end of class and it will be changed from as absence to a tardy. (3 tardies=1 absence)
- D. Any student doing unsatisfactory work, failing, lack of participation (attitude), lack of following safety rules etc. may be dropped from the course at the discretion of the instructor. Plagiarism, in any form, will have consequences from earning a zero on an assignment to dismissal from the class.

Lab practical exams can NOT be made up. Period. Lecture exams can not be made up, unless extreme circumstances, documented in writing, are provided. The instructor holds final decision on what constitutes an acceptable circumstance.

TESTS AND EVALUATION

| <u>Description</u> | <u>Possible Points</u> |
|---|------------------------|
| 3 Lecture Exams (100 points each) | 300 |
| 1 Final Exam (Cumulative) | 150 |
| 10 Lecture/Lab Quizzes (10 points each) | 100 |
| 3 Laboratory Exams (100 points each) | 300 |
| 1 Unknown Lab Report | 25 |
| 1 Term Paper/Presentation | <u>125</u> |

Total points
Extra Credit (see VII below)

1,000
Maximum of: 25

To calculate your grade, total all points earned and divide that number by the total points available (1,060). **Course grades are non-negotiable; Instructor reserves the right to curve individual tests and/or assignments. FINAL GRADES WILL NOT BE CURVED... ALSO, I DO NOT round up your grades to the next letter grade.**

The final course grade is based on:

| Percent Range | Grade |
|---------------|-------|
| 90-100 | A |
| 80-89.99 | B |
| 70-79.99 | C |
| 60-69.99 | D |
| Less than 60 | F |

Lecture exams may be any combination of multiple-choice, true-false, matching, short-answer and essay questions based on the main objectives of each chapter. Please note that I require correct spelling and grammar. If I can't read it, I can't grade it! Write neatly!

Lab exams will be practical based on the work done in the laboratory. They may include multiple choice, true-false, matching, essay and short answer questions.

Lecture final exam will be comprehensive. Since this course is a prerequisite for all other Biology classes, it is important that you retain as much knowledge as possible from this course to ease your way in the following semesters.

Quizzes will occur on dates specified on the course schedule. Quizzes are given at random during the class period and last for 20 minutes, if you are late your quiz will still be collected 20 minutes from when the quiz began. Material may include and combination of multiple-choice, true-false, matching, and short answer questions. 10 quizzes will be given, your lowest score will be dropped.

Case Study/Term Paper will be assigned in the 5th week of class. At this time, the class will select a topic for presentation from the list of approved microorganisms. At the conclusion of the semester, each student will give a 10-15 presentation to the class describing their microorganism, and a formal written report must be submitted. Specific directions will be handed out in class.

****NO WRITING ASSIGNMENTS WITH A TURNITIN.COM PLAGIARISM SCORE OF MORE THAN 30% WILL BE ACCEPTED****

Extra Credit At the discretion of the instructor extra credit MAY be available at intermittent points in the term, if you feel you have a borderline grade this is the only opportunity for grade increases.

**** I reserve the right to make changes in this syllabus with notification ****

STUDENT LABORATORY CONDUCT

- Students are to maintain clean areas at all times. Keep unnecessary books, papers, purses, etc., off the laboratory tables.
- Disinfectant laboratory tables at the beginning and at the end of every lab period.
- Aseptic techniques are to be followed at all times.
- Lab coats are to be worn in the lab at all times. Students with long hair must keep it contained with pins, clips, headbands, or rubber bands, etc. so that it will not sweep across desks, Bunsen burners, and/or microscopes. Legs are to be covered at all times. Closed-toed shoes and socks are to be worn at all times.

- E. Caution must be exercised in handling stains and other reagents, as they may be harmful to clothing, skin, eyes, floor, etc. Safety glasses must be worn when handling and using caustic or other dangerous chemicals. They are available in the classroom.
- F. Any spills of living organisms must be reported to your instructor immediately! Should a spill occur and not be reported immediately, these are grounds for removal from the class.
- G. If you spill on anything, bags, jackets, shoes, accessories, it WILL go into the autoclave for sterilization (and could be destroyed).
- H. Food and drinks are NOT allowed in the laboratory! NEVER eat or drink in the laboratory and avoid putting any objects in your mouth. Some organisms used in class are potentially pathogenic or are pathogenic.
- I. Wash your hands thoroughly and dry them before you leave the laboratory.
- J. Adhere to the Reedley Community College rules of student dress and conduct.

Canvas

All lecture and lab handouts, lecture notes, course schedules, and announcements are available at <http://www.reedleycollege.edu/index.aspx?page=1911>. Your user name and password will be discussed in class.

Professional Behavior is expected at ALL TIMES

Please respect other student, the laboratory materials, and me. No food, cellular phones, pagers, or profanity at any time! I am aware that emergencies arise, but place your electronics on silent or "manner" mode. Disruptive behavior that interferes with the teaching and learning processes will be cause for appropriate penalties as described under "University Policies" below.

Food and/or liquids in the laboratory may result in deduction of points.

You will be given a Safety Rules sheet to sign in the lab, which delineates further safety procedures that you MUST follow. OTHER COURSES USE THE MODELS AND THE LAB. PLEASE BE RESPONSIBLE. Do not use pencils to point out structures on the models. Please remember to clean up the lab after every exercise, as areas left dirty or messy at the end of the period will result in those student groups being **docked 5 points** for every offense.

No food or beverages allowed. Cell phone use will not be tolerated in this class; turn off your cell phones prior to class. Students are allowed to do audio recordings of lectures but not video. Web or internet posting of recorded lecture materials are not allowed. Laptops may be used in this class; laptop users should sit in the back row to avoid distracting others.

Miscellaneous

A. Laboratory and Field Trip Safety

1. Follow directions in the student conduct section.
2. Report all accidents or injuries immediately.
3. Wear appropriate clothing as indicated above and on field trips wear appropriate footwear. This would be oxford or walking shoes or leather closed toe tennis shoes.

NO SANDALS OR OPEN TOED (OR MESH TOED) LOOSE FOOTWEAR OR SHORTS WILL BE ALLOWED IN CLASS OR ON FIELDTRIPS.

College Policies

The university has several policies that you will be expected to adhere to in my course. The **Policy on Students with Disabilities, the University Honor Code, the Policy on Cheating and Plagiarism, a statement on copyright**, and the **university computer requirement**, portions of which are below, can all be found in the University Catalog (Policies and Regulations) and Class Schedule.

Cheating and Plagiarism: I DO NOT TOLERATE CHEATING. PERIOD. Most of you are entering into the health care field and could harm or seriously injure other human beings if you do not know the basic information in this course. The University policy reads, "Cheating is the actual or attempted practice of

fraudulent or deceptive acts for the purpose of improving one's grade or obtaining course credit; such acts also include assisting another student to do so. Typically, such acts occur in relation to examinations. However, it is the intent of this definition that the term 'cheating' not be limited to examination situations only, but that it include any and all actions by a student that are intended to gain an unearned academic advantage by fraudulent or deceptive means.

Any student caught cheating or plagiarizing will be subject to the Reedley College disciplinary procedures (review the Reedley College catalog section on academic dishonesty). Electronics of any kind are not permitted during exams and will result in an automatic zero for that exam.

Students with diagnosed disabilities should contact the Disabled Students Programs and Services' (DSP&S). Please give me a copy of the letter you receive from DSP&S detailing class accommodations you may need. If you require accommodation for test-taking please make sure I have the letter no less than three days before the test. If you have a need for an academic accommodation or materials in alternate media (i.e., Braille, large print, electronic text, etc.) per the Americans with Disabilities Act (ADA) or Section 504 of the Rehabilitation Act, please contact me as soon as possible.

HELP AND TUTORIAL SERVICES

If you should experience difficulty understanding the material presented in the class or lab, please see your instructor in her office at the earliest possible date, either during scheduled office hours or by appointment.

If you are struggling in the class, please go to the tutorial center for assistance. "With this statement on my course syllabus, I am referring each of my enrolled students in need of academic support to tutorial services. Referral reason: Mastering the content, study skills, and basic skills of this course is aided by the use of trained peer tutors".

If you should experience difficulty understanding the material presented in the class or lab, please see your instructor in her office at the earliest possible date, either during scheduled office hours or by appointment.

VII. TENTATIVE SCHEDULE

Please bring your textbook to lecture and your textbook and lab manual to every lab. This is very important!

| Week | Dates | Lecture (Book Chapter) | Laboratory Experiments |
|------|-------|--|--|
| 1 | Tue | Introduction, and Syllabus Historical Developments in Microbiology (1) | Laboratory Safety |
| 1 | Thu | Historical Developments in Microbiology (1) Microscopes & Staining Techniques (3) | Microscopy and Aseptic Technique |
| 2 | Tue | Microscopes & Staining Techniques (3) Quiz 1 | Viewing Live Organisms |
| 2 | Thu | Anatomy of Bacteria I (4) | Microscopic Measurements |
| 3 | Tue | Anatomy of Bacteria I (4) Microbial Growth (6) Quiz 2 | Simple Staining and Media Making |
| 3 | Thu | Microbial Growth (6) Control of Microbial Growth (7) | Negative Staining |
| 4 | Tue | Lecture Exam 1 (1,3,4,6) | Gram Stain |
| 4 | Thu | Control of Microbial Growth (7) | Acid Fast and Endospore Stains |
| 5 | Tue | Important Biological Molecules (2) | Lab Exam 1 |
| 5 | Thu | Important Biological Molecules II (2) | Environmental Microorganisms |
| 6 | Tue | Microbial Metabolism I (5) Quiz 3 | Transfer of Bacteria |
| 6 | Thu | Microbial Metabolism II (5) | Isolation of Bacteria by Dilution and Streak Plate Technique |
| 7 | Tue | Microbial Genetics I (8) Quiz 4 | Carbohydrate Catabolism |
| 7 | Thu | Microbial Genetics I (8-9) | Fermentation of Carbohydrates |
| 8 | Tue | Microbial Genetics II (9) | Differential/Selective Media |
| 8 | Thu | Classification of Microorganisms (10) | DNA |
| 9 | Tue | Lecture Exam 2 (7,2,5,8,9) | Protein Metabolism I&2 |
| 9 | Thu | Bacteria I (11) | Respiration Nitrate/Catalase/Entero/Oxidase |
| 10 | Tue | Bacteria II (11) Quiz 6 | Lab Exam 2 |
| 10 | Thu | Fungi, Protozoans, and Helminths (12) | Oxygen Requirements and pH/Osmotic Pressure |
| 11 | Tue | Fungi, Protozoans, and Helminths (12) Quiz 7 | Physical Methods of Control: Heat |
| 11 | Thu | Viruses I (13) | UV Radiation |
| | | Spring Break: March 26-March 30 No Class | |

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| 12 | Tue | Viruses II (13) Quiz 8 | Disinfectants and Antiseptics |
| 12 | Thu | Principles of Disease and Epidemiology (14) | Chemical Methods of Control: Antimicrobial Drugs |
| 13 | Tue | Principles of Disease and Epidemiology (14) Mechanisms of Pathogenicity (15) | Effectiveness of Hand Scrubbing |
| 13 | Thu | Mechanisms of Pathogenicity (15) Non-Specific Defenses of the Host I (16) | Yeasts and Molds |
| 14 | Tue | Lecture Exam 3 (10,11,12,13 & Disease List) | Protozoans |
| 14 | Thu | Non-Specific Defenses of the Host II (16) The Immune Response II (17) | Flora of the Mouth, Throat, and Skin |
| 15 | Tue | The Immune Response II (17) Quiz 9 | Isolation of Unknowns |
| 15 | Thu | Antimicrobial Drugs (20) | Isolation of Unknowns |
| 16 | Tue | Antimicrobial Drugs (20) Quiz 10 | Isolation of Unknowns |
| 16 | Thu | Microbiology of Water (27) | Isolation of Unknowns/Presentations |
| 17 | Tue | Microbiology of Water (27) | Lab Exam 3 |
| 17 | Thu | Final Exam Review | Presentations/Clean up |
| 18 | Tue | Final Exam (Cumulative) | |

Chapters: 21, 22,, 23, 24, 25, & 26. Read for Content. This material will NOT be covered in lecture. You will be tested on this material in Examination 3. I would suggest that you begin reading this material at your earliest convenience. Further instructions will follow in lecture.

Important Dates

- September 4th Last day to drop with no "W" on transcript.
- September 15th Last day to declare PASS/NO PASS grade option.
- October 13th Last day to drop with a "W."
- FINAL EXAM TUESDAY December 12th at 5:00PM in LFS-6