PRINCIPLES OF MICROBIOLOGY -- LAB

SPRING 2010

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SECTIONS TAUGHT:
BIOL 2421.C1L  M/W  1:00 PM – 2:50 PM, A312
*BIOL 2421.C2L  T/Th  11:00 AM – 12:50 PM, A312*

COURSE DESCRIPTION
Classification, cell structure, metabolism, and historical concepts of microorganisms including bacteria, viruses, fungi, protozoa, Chlamydia and Rickettsia. Infectious diseases and immunology will be emphasized. Practical microbiology will include diagnostic microbiology of water, food, sewage, soil, and industrial applications. Laboratory methods are stressed, and experimentation with pure cultures of medical, environmental, and industrial importance is used extensively. Lecture required. Prerequisite: BIOL 2402 within the last five years

COURSE CREDIT HOURS:  4 (LECTURE: 3, LAB: 4)

PRE-REQUISITE COURSE:  BIOL 2402 with a minimum grade of “C” within the last 5 years or consent of department chair

CO-REQUISITE COURSE:  Microbiology Lecture

COURSE DELIVERY METHOD:  Laboratory

TEXTBOOK:
Online course packet:  “Microbiology Lab Manual 2421L” by Cain et. al.   (see website address above) (required)

SUPPLIES NEEDED:  (required)
3-ring binder
Permanent marker (such as a Sharpie)
Disposable plastic lab apron or lab coat
Disposable gloves
*Note:  Markers, aprons, and gloves can be stored in the laboratory in your designated drawer.

MEASURABLE STUDENT LEARNING OUTCOMES:
Upon completion of the laboratory course, the students should be able to do the following:
1. Demonstrate a working knowledge of appropriate biosafety procedures and proper aseptic technique.
2. Effectively use a compound light microscope, including correctly setting up and focusing the microscope; proper handling, cleaning, and storage of the microscope; and correct use of all lenses, including the oil immersion lens.
3. Perform a Gram-stain, and describe the differences between Gram-positive and Gram-negative cells.
4. Obtain single, isolated colonies of bacteria using a streak plate method.
5. Correctly perform serial dilutions and plate counts to estimate the number of microbes in a sample.
6. Describe the major oxygen classes of bacteria, and explain how to grow bacteria in anaerobic environments.
7. Measure the efficacy of antibiotics and antimicrobial chemicals using a disk diffusion assay.
8. Demonstrate the ability to use biochemical tests to determine the identity of bacterial unknowns.

COURSE REQUIREMENTS:
The laboratory grade with be integrated with your lecture grade to determine the final grade for the course (35% lab and 65% lecture). Laboratory grades will be assigned as follows:
   Quizzes:  20%
   Lab Assignments:  20%
   (Unknown Report, 15% and Lab Notebooks , 5%)
   Lab Practicals I & II:  30% each
QUIZZES will be given at the beginning of class according to the laboratory schedule, and will cover material from the previous day’s experiments. If you arrive late to class after the quizzes have been collected, you will not be allowed to take the quiz. No makeup quizzes will be given. Grades will be assigned for quizzes missed during excused absences based on your final practical exam grade. When final grades are calculated, the lowest quiz grade will be dropped.

LAB NOTEBOOKS will be collected and graded at the midterm and final practical exams.

UNKNOWNWS will be assigned to each student the latter part of the semester, and will require a formal lab write up. A separate handout will provide detailed instructions for the format of these reports.

EXAMS will consist of a midterm lab practical and a final lab practical.

LABORATORY RULES
*Absolutely no eating or drinking in the lab.
*No open-toed shoes may be worn in the lab.
*Microscopes must be cleaned thoroughly after each use and put away properly.
*Students are responsible for cleaning up their areas at the end of each lab period, and properly disposing of all waste.
*All biosafety rules must be followed at all times.

LABORATORY EXERCISES will usually be performed as group exercises. Each lab group will be assigned a specific color, and will use colored tape to label their bacterial cultures, making it easier to identify and retrieve them from the incubator. Since bacteria need time to grow, most of the lab exercises will be set up and inoculated during the Tuesday lab period, and results will be obtained during the Thursday lab period.

PARTICIPATION is a vital component of all laboratory courses, therefore attendance is mandatory. You will be allowed two unexcused absences during the semester before your grade is affected. Each additional unexcused absence will result in a 5% reduction in your final grade. ABSENCES will be excused only if documentation of a CCCCD-approved excuse is provided. It is your responsibility to provide such documentation upon your return to class. If an absence is unexcused, you will not be allowed to make up any missed assignments. If a student misses more than three lab periods in the semester, that student will be strongly urged to drop the course. Last day to withdraw: 3/12/10

Religious Holidays: refer to the current CCCCD Student Handbook.

STUDENT CONDUCT
The college expects students to conduct themselves in the lab in such a way as to not interfere with or disrupt the educational process. Students are to speak and act in a respectful manner toward their fellow students and the professor. Those who participate in inappropriate behavior such as, excessive talking, cell phone use (including texting), verbal altercations, or blatantly disregarding instructor’s directions will be asked to leave the class. Continuance of such behavior will result in a referral to the Dean of Students for disciplinary action.

LABORATORY ETIQUETTE
*Cell phones and other telecommunication devices should be turned off or silenced during lab.
*Students should not talk to each other while the instructor or another student is speaking.
*Students should make every effort to be ON TIME.
*Students should contribute equally to group laboratory exercises.

LATERAL TRANSFERS
Lateral transfers will not be granted after the 4th week of class or after the first lecture exam, which ever comes first. Exceptions to this are for documented changes in work schedule and family emergencies. If a student does transfer to another section, all previous grades will accompany the student. However, the new instructor can require the student to retake any exam or quiz. For questions concerning lateral transfers, contact the Biology Department Chair.

COLLEGE REPEAT POLICY
You may repeat this course only once after receiving a grade, including W.

WITHDRAWAL POLICY
Texas Education Code 51.907 Course Drop Limit Provisions
Students who enroll as an entering freshman or a first-time college student in undergraduate courses at any Texas public community college, technical institute, health sciences institution, or any public university offering undergraduate courses
must comply with the legislation of TEC51.907. TEC51.907 states that students who enroll for the first time during the fall 2007 semester or any subsequent semester are subject to the course drop limit of six course drops. This includes any course a transfer student has dropped at another institution. Collin College did not begin to count dropped courses until the fall 2008 semester. For more information go to http://www.ccccd.edu/aro/withdrawal.htm.

AMERICAN DISABILITIES ACT STATEMENT
It is the policy of Collin County Community College to provide reasonable and appropriate accommodations for individuals with documented disabilities. This college will adhere to all applicable Federal and State laws, regulations, and guidelines with respect to providing reasonable accommodations as required to afford equal educational opportunity. It is the student's responsibility to contact the ACCESS office (SCC G200, 972-881-5898, V/TDD 972-881-5950) in a timely manner if he/she desires to arrange for appropriate accommodations.

ACADEMIC ETHICS
The College District may initiate disciplinary proceedings against a student accused of scholastic dishonesty. Scholastic dishonesty includes, but is not limited to statements, acts, or omissions related to applications for enrollment or the award of a degree, and/or the submission as one’s own work material that is not one’s own. Scholastic dishonesty may involve, but is not limited to, one (1) or more of the following acts: cheating, plagiarism, collusion, use of annotated texts or teacher’s editions, and/or falsifying academic records.

Plagiarism is the use of an author’s words or ideas as if they were one’s own without giving credit to the source, including, but not limited to, failure to acknowledge a direct quotation.

Cheating is the willful giving or receiving of information in an unauthorized manner during an examination, illicitly obtaining examination questions in advance, copying computer or Internet files, using someone else’s work for assignments as if it were one’s own, or any other dishonest means of attempting to fulfill the requirements of a course.

Collusion is intentionally or unintentionally aiding or attempting to aid another in an act of scholastic dishonesty, including but not limited to, failing to secure academic work, providing a paper or project to another student; providing an inappropriate level of assistance; communicating answers to a classmate about an examination or any other course assignment; removing tests or answer sheets from a test site, and allowing a classmate to copy answers. In accordance with college guidelines, students suspected of academic dishonesty will be referred to the Dean of Students for an investigation. Students found guilty of scholastic dishonesty will receive an authorized disciplinary penalty from the Dean of Students Office as well as an academic penalty in the course. For more information, contact the Dean of Students for the student disciplinary process and procedures or consult the CCCCD Student Handbook.

FERPA COMPLIANCE
Student performance cannot be discussed with anyone other than the student, unless written permission is provided by the student. Student information can not be given to students over the phone or via non-secure e-mail addresses. Students may use their cougarmail e-mail address, provided by the college to all students, to communicate with the professor about grades and other sensitive information.

CHANGES TO SYLLABUS
The instructor reserves the right to alter the syllabus as needed at any time during the semester. Changes to the syllabus will be provided to the students in writing.
<table>
<thead>
<tr>
<th>WEEK</th>
<th>TOPICS</th>
<th>EXPERIMENTS</th>
<th>ASSIGNMENTS/QUIZZES</th>
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</table>
| 1    | T: Course Introduction and Biosafety  
R: Microscopy | (pp. 4-6) 1 | R (1/21): Quiz 1: Biosafety |
| 2    | T: Staining Specimens and Smear Preparation  
Gram Stain & Capsule Stain  
R: Acid Fast Stain & Endospore Stain | (pp. 8-9) 2,3 4,5 | R (1/28): Quiz 2: Gram & Capsule stains |
| 3    | Culture Transfer Techniques  
Isolation of Pure Cultures  
Viable Plate Counts | 6 7 8 | T (2/2): Quiz 3: Acid fast & spore stains  
R (2/4): Microscopy Skills Quiz must be completed by today (Quiz 4) |
| 4    | Effect of Temperature on Microbial Growth  
Atmospheric Oxygen Requirements  
Cultivation of Anaerobic Organisms | 9 10 11 | R (2/11): Quiz 5 due (take-home): Cultures & plate counts |
| 5    | Use of Selective, Differential, & Enriched Media  
Chemical Control of Microorganisms  
Chemotherapeutic Agents  
Additive and Synergistic Effects of Antibiotics | 12 13 14 15 | T (2/16): Quiz 6: Temperature & Oxygen |
| 6    | Microbial Flora of the Mouth  
Normal Flora of the Throat and Skin  
Cultivation of Urine Specimens | 16 17 18 | T (2/23): Quiz 7: Selective & Differential Media; Antibiotics |
| 7    | T: Review for Practical  
R: Lab Practical I | | T (3/2): Quiz 8: Normal flora & Urine Cultures  
R: LAB PRACTICAL I & Notebooks due (March 4) |
| 8** | Identification of Bacillus species  
Transformation | 19 20 | |
|      | Spring Break March 15-19 | | |
| 9    | Catalase Test  
Identification of Staphylococcus species  
Identification of Streptococcus species  
Coagulase Test | 21 22 23 24 | T (3/23): Bacillus flow chart due (Quiz 9) |
| 10   | Identification of Gram-negative species | 26 | |
| 11   | Unknowns | | |
| 12   | Unknowns | | R: Unknown flow chart due (4/15) |
| 13   | T: Rapid Strep and Staph Tests  
Staining Patient Specimens  
R: Library Day – no lab! | 27, 28 29, 30 | T: Quiz 10 (Take home) Due  
R: Unknown report DUE (April 29) |
| 14   | Yogurt Production  
Water Microbiology  
Food Microbiology | 31 32 33 | |
| 15   | T: Review for Practical  
R: Lab Practical II | | T: Quiz 11: Food & Water  
R: LAB PRACTICAL II & Notebooks due (May 6) |
| 16   | No lab during finals week | | **Last day to withdraw, March 12** |