CoSM Class Policy

Fall 2011
BIO 308L Sections 020, 021, and 022
PRE-NURSING MICROBIOLOGY LAB

Name: Mr. Ron Havner, Instructor
Department: Biology
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Phone: 468-5196
Office: Miller Science, Rm 237
Office Hours: Monday through Thursday, 8 to 9 am, 2:30 to 3:30 pm and by appointment.

Class meeting time and place: Tuesdays and Thursdays
BIO 308L020 9:30-11:20am in Miller Science Room 208
BIO 308L021 12:15-1:50pm in Miller Science Room 208
BIO 308L022 4:45-5:50pm in Miller Science Room 208

Required Text and Materials:
Laboratory Manual & Workbook in MICROBIOLOGY, Applications to Patient Care, 10th Edition,
Latex or Vinyl gloves, Lighter or matches, and an Alcohol Based Marker (Medium Black)
Recommended text: TECHNIQUES IN MICROBIOLOGY, A Student Handbook, Lammert,

Course Requirements:
Students must be currently enrolled in BIO 308 Lecture. Students will learn basic microbiology laboratory protocols
including specimen collection, cultivation, analysis, identification, and reporting (verbal and written). Students are
provided with a specimen of medical relevance and will maintain, analyze, identify and report, verbal presentation
and written report, information concerning this specimen.

Course Calendar:
Introduction, Safety, Aseptic Technique 2 hours
Cultural and Growth Characteristics 8 hours
Cellular Characteristics 4 hours
Metabolic/Enzymatic Testing/Analysis 12 hours
Dilutions 4 hours
Applied Medical Microbiology 6 hours
Exams 3 hours
Presentation of Data 2 hours
See attached lab schedule

Grading Policy:
Lab Practical Exam #1: 100 points
Lab Practical Exam #2: 100 points
Lab Daily Quizzes: 100 points
Dilution Exam: 100 points
Individual’s Lab Write-up: 50 points
Team Presentation: 50 points

Grading will be as follows:
(Percentages refer to points earned from points possible)
90% and above: A
80% to 89%: B
70% to 79%: C
60% to 69%: D
68% or less: F

Total points possible: 500 points
Attendance Policy:
At the beginning of each lab I will pass out a signature roster. Since attendance is mandatory, you will receive no direct credit for it (although the effects of missing a lab will show up in other evaluated activities). In the event that a student must miss a lab period for unavoidable reasons (instructor’s discretion), the student will notify the instructor at least one day PRIOR to that lab. Failure to attend more than three scheduled labs will result in a failing grade for the lab. It is the responsibility of the student to arrange for any makeup activity with the instructor. Labs missed with prior approval will be made up Friday afternoons.

Academic Integrity (A-9.1)

Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

Definition of Academic Dishonesty
Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one’s own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one’s paper without giving the author due credit.

Please read the complete policy at http://www.sfasu.edu/policies/academic_integrity.asp

Withheld Grades Semester Grades Policy (A-54)

Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average.

The circumstances precipitating the request must have occurred after the last day in which a student could withdraw from a course. Students requesting a WH must be passing the course with a minimum projected grade of C.

Students with Disabilities

To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices/.

Acceptable Student Behavior

Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy D-34.1). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed.
BIO 308 Pre-Nursing Microbiology Laboratory

Course Description:
Study of microorganisms to include bacteria, viruses, fungi, and protozoa with emphasis on laboratory methodology and the structure and function of common microorganisms of medical relevance.

Pre-requisites: One semester of Biology and one semester of Chemistry.
Co-requisite: BIO 308 Lecture.

Course Objectives:
- Provide students with an understanding of important facts, concepts, and the investigative procedures of a microbiology laboratory.
- Train students in the proper use and maintenance of the research grade laboratory microscope with emphasis on oil immersion methods.
- Train students in aseptic technique, prophylaxis, and the proper methods relating to the safe manipulation and maintenance of microorganism.
- Train students in fundamental laboratory methodology to include the use of differential media, metabolic/enzymatic testing and associated reagents.
- Provide students with a hands-on familiarity with basic research procedure and associated critical and investigative thinking skills utilizing identification of unknown microorganismal specimens.
- Provide students with an understanding of medically relevant (pathogenic and non-pathogenic) microorganisms.

Student Learning Outcomes (Course Competencies):

Knowledge and Understanding
Student understanding will be evaluated by utilization of laboratory practical exams, weekly quizzes, and a selected written exam (laboratory dilutions). Students will demonstrate:

- The safe methods for isolation, subculture, and maintenance of bacterial, fungal, and viral specimens.
- An understanding of fundamental stains, basic staining techniques, and related bacterial and fungal physiology.
- An understanding of bacterial, fungal, and viral structure and metabolism as it relates to identification and control of pathogenic organisms.
- An understanding of the uses of various media and testing protocols with focus on clinical applications.
- An understanding of the common pathogenic microorganisms and the disease processes they cause.

Subject Specific Skills
Students will demonstrate mastery of:
- Quantitative measures; weight, volume, concentrations.
- Aseptic technique; handling and analysis of specimens, reagents, other testing materials and the maintenance of a sterile work area.
- Analysis and identification of bacterial by genus and species utilizing methods mastered in the laboratory. Emphasis on common clinical protocols.
- Adequate utilization of reference resources such as Bergey’s Manual of Systematic Bacteriology.
- Skill in the logical communication of microbiology laboratory concepts through effective report writing and oral presentation.

Program Learning Outcomes:
Each of the student learning outcomes listed above address the Biology Department Program Learning Outcome #1: Demonstrate a good knowledge base in biological concepts and be able to integrate knowledge with critical thinking skills to become problem solvers. Knowledge base will include: levels of complexity (molecular/cellular through population/communities/ecosystems); biological principles and processes.
Course Content (Topical Outline):

- Introduction to the Microbiology Laboratory [1 week]
  o Safety materials and procedure
  o Aseptic Technique
  o Hand Washing
  o Normal Microbiota
  o Nosocomial Infections
- Microscopy [1 week]
  o Operation of the research light microscope
  o Microbial scale
  o Oil Immersion technique
- Clinical Specimens [1 week]
  o Assignment of specimens
  o Subculture
  o Colony morphology and form of growth
  o Physical factors affecting growth and control
- Stains [1 week]
  o Negative and Simple stains; cell morphology and form of growth
  o Gram, Endospore, Acid-Fast stains; cellular structure
- Dilution and Quantification of microorganisms [1 week]
  o Spread, pour, and streak plates
  o Determination of bacterial concentrations
- Metabolic and Enzymatic Analysis [6 weeks]
  o Differential media
  o Hemolysis
  o Fermentation
  o Proteins and enzymes
  o Metabolic waste
- Microbiology of the Respiratory Tract [1 week]
  o Identification of Staphylococcal species
  o Identification of Streptococcal species
  o Identification of Pneumococcal species
- Microbiology of the Digestive System [1 week]
  o Enterobacteriaceae
  o Identification of Clostridial species
  o Other enteric pathogens and Microbiota
  o Analysis of Stool samples
- Microbiology of Urinary/Reproductive systems [1 week]
  o Common pathogens
  o Urinalysis
- Antibiotic Testing and Antibiotic Resistance [1 week]
  o Kirby-Bauer
  o Bacterial Evolution
- Presentation of Data [1 day]
  o Oral Group Presentation (PowerPoint)
  o Written Lab report
<table>
<thead>
<tr>
<th>Dates</th>
<th>Lab</th>
<th>Data Collection</th>
<th>Reference</th>
<th>Exercise Number and Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuesday 30 Aug 11</td>
<td>PN 01</td>
<td>None</td>
<td>Handouts</td>
<td>Intro to the Microbiology Lab, Syllabus, Schedule, Safety</td>
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<tr>
<td>Thursday 1 Sep 11</td>
<td>PN 02</td>
<td>None</td>
<td>Demo, Handouts 1-2, pgs ix-xi, pgs 65-66. 105</td>
<td>Aseptic Technique, Hand Washing, Normal Microbiota</td>
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<tr>
<td>Thursday 8 Sep 11</td>
<td>PN 03</td>
<td>Hand Washing Plates</td>
<td>Handout 3, pgs 1-9</td>
<td>The Microscope, Nomenclature, Handling, Cleaning, Through-Focus Technique</td>
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<tr>
<td>Tuesday 13 Sep 11</td>
<td>PN 04</td>
<td>None</td>
<td>Handout 4, pgs 11-20, 61-63</td>
<td>Cultural Characteristics, Assignment of Specimens, Selectivity and Differential Media; Nutrient Agar, Mannitol Salt, MacConkey’s, Actinomycetes Agar, and Rose Bengal</td>
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<tr>
<td>Thursday 15 Sep 11</td>
<td>PN 05</td>
<td>Record Cultural Growth Characteristics</td>
<td>Handout 5</td>
<td>Optimal Growth Characteristics, Temperature, Osmolarity (What happens to PROTEINS?)</td>
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<tr>
<td>Tuesday 20 Sep 11</td>
<td>PN 06</td>
<td>Record ranges for optimal growth</td>
<td>Handout 6, pgs 240-245</td>
<td>Aerobicity: Aerobes, Anaerobes, Facultative Anaerobes, Aerotolerants</td>
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<tr>
<td>Thursday 22 Sep 11</td>
<td>PN 07</td>
<td>Record Aerobicity Data Slants in Freezer</td>
<td>Handout 7, pgs 21-34</td>
<td>Prepare Freezer Slants, Stains, Part I; Acidic, Basic, Negative, Simple, and Gram Staining; Cell Morphology</td>
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<tr>
<td>Tuesday 27 Sep 11</td>
<td>PN 08</td>
<td>Retrieve Freezer Slants</td>
<td>Handout 8, pgs 35-44</td>
<td>Stains, Part II; Endospore and Acid-Fast Staining (Genus Bacillus and Genus Mycobacteria); (Get slants from freezer)</td>
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<tr>
<td>Thursday 29 Sep 11</td>
<td>PN 09</td>
<td>View all Slide Preps</td>
<td>Demo</td>
<td>Oil Immersion, Pre-Focus Technique</td>
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<tr>
<td>Tuesday 4 Oct 11</td>
<td>PN 10</td>
<td>None</td>
<td>Handout 9, pgs 107-112</td>
<td>Selectivity and Differential Media; Nutrient Agar, Mannitol Salt, MacConkey’s, Actinomycetes Agar, and Rose Bengal</td>
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<tr>
<td>Thursday 6 Oct 11</td>
<td>PN 11</td>
<td>Record Media growth data</td>
<td>Instructor’s Notes and Demo</td>
<td>Metabolism: Litmus Milk and Casein Digest testing</td>
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<tr>
<td>Tuesday 11 Oct 11</td>
<td>PN 12</td>
<td>Record Metabolic data</td>
<td>Instructor’s Notes, Demo, pgs 113-114</td>
<td>Metabolism; Carbohydrate Fermentation, Gelatin and Urease</td>
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<tr>
<td>Thursday 13 Oct 11</td>
<td>PN 13</td>
<td>Record Metabolic data</td>
<td>pgs 117, 122-124</td>
<td>Hemolysis, Catalase, Oxidase and Triple Sugar Iron Testing</td>
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<tr>
<td>Tuesday 18 Oct 11</td>
<td>PN 14</td>
<td>Record Hemolysis/TSI data</td>
<td>pgs 121-122, 186-187</td>
<td>Enzyme Analysis; Urease and IMViC testing</td>
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<td>Thursday 20 Oct 11</td>
<td>PN 15</td>
<td>None</td>
<td>N/A</td>
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<tr>
<td>Tuesday 25 Oct 11</td>
<td>PN 16</td>
<td>Record Urease and IMViC data</td>
<td>Demo</td>
<td>Lab Practical Exam #1</td>
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<tr>
<td>Date</td>
<td>PN</td>
<td>Notes</td>
<td>Handout/Notes</td>
<td>Topic</td>
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<tr>
<td>Thursday 27 Oct 11</td>
<td>PN 17</td>
<td>None</td>
<td>Instructor's Notes and Demo</td>
<td>Lab Result Write-up and Presentation, tentative Dilutions</td>
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<tr>
<td>Tuesday 1 Nov 11</td>
<td>PN 18</td>
<td>None</td>
<td>pgs 91-94</td>
<td>Kirby-Bauer Antibiotic Testing</td>
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<td>Thursday 3 Nov 11</td>
<td>PN 19</td>
<td>Record Antibiotic data</td>
<td>Handout 10, Instructor's Notes and Demo</td>
<td>Simple and Serial Dilutions</td>
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<tr>
<td>Tuesday 8 Nov 11</td>
<td>PN 20</td>
<td>Calculate Dilution data</td>
<td>None</td>
<td>Serial Dilutions; Counting Viable Cells</td>
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<td>Thursday 10 Nov 11</td>
<td>PN 21</td>
<td>None</td>
<td>Handout 11, pgs 141-153</td>
<td>Microbiology of the Respiratory Tract Isolation and Identification of Staphylococci</td>
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<td>Tuesday 15 Nov 11</td>
<td>PN 22</td>
<td>Analyze Respiratory media</td>
<td>pgs 154-155 165-172</td>
<td>Streptococci, Pneumococci and the CAMP test</td>
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<td>Thursday 17 Nov 11</td>
<td>PN 23</td>
<td>Analyze CAMP data</td>
<td>Handout 12, pgs 185-201</td>
<td>Microbiology of the Intestinal Tract; The Enterobacteria</td>
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<tr>
<td>Tuesday 22 Nov 11</td>
<td>PN 24</td>
<td>Analyze Intestinal data</td>
<td>Handout 13, pgs 209-217</td>
<td>Microbiology of the Urinary and Genital Tracts</td>
</tr>
<tr>
<td>Tuesday 29 Nov 11</td>
<td>PN 25</td>
<td>Observe Urinary data</td>
<td>N/A</td>
<td>Group Presentations and Lab Results Write-up</td>
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<tr>
<td>Thursday 1 Dec 11</td>
<td>PN 26</td>
<td>None</td>
<td>N/A</td>
<td>Lab Practical Exam #2</td>
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