

**Syllabus**  
**Biology 2420**  
**Microbiology for the Health Sciences**  
**Summer Semester 2012**

**Section: 04755 (009) (M/W)**  
**Lab 6:00 P.M. → 7:55 P.M. Lab room = CYP1 – 1133**  
**Lecture 8:05 P.M. → 10 P.M. Lec room = CYP1 - 1133**

Instructor: Rob Lewis

Preferred Phone: 512.775.6940

Office hours: Monday - Thursday

5:30 pm – 6:00 pm CYP adjunct office cube  
or Micro Prep room

By appointment: CYP - TBA

For conferences outside of office hours, leave a voice mail message or e-mail me at **rlewis3 (at) austincc.edu**

This Microbiology Class Web site – YOUR source of information! : <http://www.austincc.edu/rlewis3>

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**Important dates:**

**Final day to drop is August 1, 2012**

## Syllabus BIOL 2420

### Microbiology for the Health Sciences Spring Semester 2012

#### Course Description for BIOL 2420

The *Microbiology for the Health Sciences* class provides an overview of the microbial world and the techniques to study it. Topics include the basic characteristics of fungi, algae, bacteria, and viruses.

Special emphasis is placed on topics and applications that relate to humans.

The skills required for this class include proficiencies in reading and writing as well as official prerequisites of: **BIOL 2404 or BIOL 2304/BIOL 2101** with minimum grade of C (or equivalent with lab).

**Note:** This course does not count as credit toward the Associate of Science degree in Biology.

#### Texts/Materials

The textbooks used as a basis for the *Microbiology for the Health Sciences* lectures are:

- Bauman's *Microbiology with Diseases by Taxonomy*, 3rd edition - 2010  
Author: Robert Bauman  
ISBN-10: 9780321640437 , ISBN-13: 978-0321640437  
**and**
- *Microbiology: A Systems Approach*, second edition  
by Cowan, Marjorie Kelly; Talaro, Kathleen Park. 2008.  
McGraw-Hill: ISBN: 978-0-07-299528-2

The required laboratory manual can be either of the following:

- *Microbiology Laboratory Theory and Application*  
by Leboffe and Pierce. 2006.  
Morton Publishing Company. ISBN 0-89582-708-5.  
**OR**
- *Photographic Atlas For The Microbiology Lab (looseleaf)* 4th ed [2011]  
by Leboffe and Pierce. 2011  
Morton Publishing Company.  
ISBN-10: 0895828723, ISBN-13: 978-0895828729

Other required materials include:

- Composition notebook for recording laboratory observations and exercises
- Sharpie® brand marker for glass
- **REQUIRED** for safety -- closed toe shoes and long hair tied up during laboratory

Recommended materials:

- Lab coat or apron for laboratory

#### Course Outline

Content Module Description
Fundamentals of Microbiology
Microbial Metabolism and Genetics
Microbial Growth and Control
Host-Microbe Interactions & Host Defenses/Disorders
Diagnosis and Infectious Diseases

#### Instructional Methodology

This *Microbiology for the Health Sciences* course is taught through lecture in the classroom and as an interactive, hands-on learning exercise in the laboratory.

## Course Rationale

This course provides a survey of microorganisms. This survey includes the various microbial environments and the microbial interactions with multi-cellular organisms, especially humans. This course pays special attention to those microbes that are pathogenic to humans. The goal of *Microbiology for the Health Sciences* is to adequately prepare students for the health science programs at ACC.

Specific skills and competencies are expected of students who successfully complete this course. These proficiencies include the following:

- Understand and explain microbiological processes in detail appropriate to this course, including:
  - History, scope and trends in microbiology
  - Germ theory of disease and its development
  - Aseptic procedures and materials for culturing and growth of microbes.
  - Enumerate and differentiate the groups of organisms included for study in microbiology.
  - Distinguish between eukaryotic and prokaryotic cell types.
  - Energy acquisition and utilization by microbes and the function of enzymes in cellular activities.
  - Microbial metabolism
  - Fundamental nucleic acid chemistry including replication, genetic code, protein synthesis, metabolic regulation, and cellular reproduction.
  - Microbial genetics, including sexual & asexual reproduction, transformation, transduction and conjugation in bacteria.
  - Biotechnology related to microbes
  - Symbiotic relationships (commensal, mutualistic, parasitic)
  - Disease process, signs, symptoms, etiology, course, prevention/control, diagnosis, treatment of common human organ system infectious diseases
  - Immunological processes, both (innate) nonspecific and specific (adaptive)
  - Principles and methods of diagnosing disease and epidemiology
- Observe phenomena, record and analyze data
- Construct graphs and/or tables from data
- Read and understand graphs to derive data/information
- Make inferences from data
- Demonstrate higher level thinking skills and problem solving
- Manipulate laboratory equipment appropriately
- Demonstrate safe work practices in a lab setting
- Work effectively as part of a team
- Demonstrate ability to understand and follow directions

## Common Course Objectives

Common course objectives are attached. They can also be found on the Biology Department home page:

<http://www2.austincc.edu/biology>

## Course Prerequisites

The official prerequisites for *Introduction to Microbiology* are **BIOL 2404 or BIOL 2304/BIOL 2101** (or equivalents with lecture and laboratory) with a minimum grade of C, as defined in the Austin Community College Catalog. These prerequisites are strictly enforced. Additionally, all biology courses require passing grades for the reading, writing, and math components of the basic skills test.

## Accommodation of Special Needs

Students with special needs that are documented by letters from the Office of Students with Disabilities must meet with the instructor during the first week of class to make arrangements for accommodation of their needs.

## Attendance

Attendance in lecture is the student's responsibility, laboratory session attendance is mandatory. Your performance in the course depends on your attendance and participation. Students with unexcused excessive absences (2 or more) can be dropped from the class.

## Lectures

The lecture schedule indicates textbook topic assignments and posted notes for each lecture period. Students are expected to read the assigned material before the scheduled date and be prepared to discuss assigned material in class. Students cannot use electronic devices during lecture without permission. No laptops, electronic pads or telephones, please.

## Exams

Students are expected to prepare for examinations that encompass all material scheduled, regardless of lecture coverage. Exams are scheduled in advance and are administered in class on the scheduled dates. Each successive exam may contain previous material, thus necessitating continuous review.

## Exam Format

Exams will include a combination of matching, multiple choice, short answer, fill-in-the-blank, and discussion or essay questions. There can also be charts, graphs, or tables to read, interpret or complete.

## Policies

The following paragraphs describe policies to which this course adheres.

## Missed Exams

A missed exam can be made up with instructor permission if the absence is excused. The exam must be made up within one week of the scheduled date of the missed exam. Make-up exams can differ in format and level of difficulty from that of scheduled exams.

## Outside Assignments

In addition to reading and preparing for both lecture and lab classes, students are required to work on hand-out materials, such as case studies and exercises, throughout the semester. Students are also required to prepare case studies or disease presentations for grading and class presentation.

## Late Work

Grades for late assignments can be reduced by ten percent (10%) of the maximum possible points on that assignment for each day the assignment is late up to the day of the unit exam. Late work will not be accepted after the end date for the unit for which it is assigned.

## Withdrawal

Although students are responsible for initiating a withdrawal (*W*) from the class, the instructor **reserves the right to** initiate student withdrawal.

## Reinstatement

To be reinstated within a class, the student must be enrolled in the course on the state reporting date, as demonstrated by the twelfth-day class roll. The student must have been withdrawn from the course in error and the student must show evidence of capability of passing the course within the time that remains in the semester. The instructor must have documentation that the student is eligible to be reinstated in the course.

## Extended Hours Support Services

The following extended hours for services are available to our students:

- Open Laboratory hours are normally available throughout the semester on Friday. Check with the laboratory assistant to determine available times, and to verify that someone will be available to let you in the lab.
- A science study lab is available at the Riverside Campus, Building A, Room 2233 Monday through Thursday 9:00 a.m. to 8:30 p.m. and Fridays 9:00 a.m. to 2:00 p.m.
- Tutoring is available in the learning labs of some campuses. See page 9 of the ACC Student Handbook for additional information.

## Course Grades and Their Calculation

The grades for this course are calculated on values from both the lecture and laboratory sections. The maximum point values for the various grade components are listed in the tables that follow.

### Lecture Grade Values:

Lecture Exams	Point Value
Exam points (based on 100%)	Total exam points/number of exams
Additional Activities	
Disease presentations	0-3 points

### Laboratory Grade Values:

Lab Exams	Point Value
Exam points (based on 100%)	Total exam points/number of exams
Lab Activity	
Attendance/ Participation/ unknowns	0-3 points

## Calculating Overall Course Grade Value

The final grade in the course consists of values from both the lecture and the laboratory. The laboratory grade is worth 25% of the final grade and the lecture is worth 75%. The average grade point values of the lecture is multiplied by three and added together with the laboratory grade average to yield the final grade percentage value.

Determine Average Lecture Value:	$(\text{Sum of Lecture exams}) / \# \text{ of exams}$
Determine Average Laboratory Value:	$(\text{Sum of Lab exams} + \text{lab activity points}) / \# \text{ of exams}$
<b>Final Grade Value</b>	$\{ [(3 \times \text{lec value}) + (\text{lab value})] / 4 \} + \text{lec presentation points}$

## Determining Letter Grades

Course letter grades are assigned based on the final percentage value accumulated by each student. The letter grades are based on percentages of the maximum possible number of points:

- 90% or more → **A**
- 80% - 89.9% → **B**
- 70% - 79.9% → **C**
- 60% - 69.9% → **D**
- less than 60% → **F**

Incomplete (I) grades will be given in consultation with the student and upon agreement of the instructor when extenuating circumstances have prevented the student from completing the course.

To be considered for an incomplete ("I"), a student must have successfully completed a minimum of four units in the course.

**Note:** An Incomplete (I) grade must be completed by a college-wide deadline before the end of the following semester, including the Spring term. If the incomplete is not completed by that deadline, the incomplete (I) grade automatically becomes a failing grade (F).

## About the Laboratory Class

The laboratory portion of BIOL 2420 is an integral and important part of microbiological education. The lab manual presents the basic concepts of microbiology in a self-instructional manner. The purpose of this approach is to encourage the students to think for themselves, take initiatives, and be responsible for their work.

Planning ahead, including reading the lab manual exercise prior to class allows for efficient work. Thinking about the process and requirements for each lab can pay great dividends. It is not beneficial to be bashful. It is efficient to cooperate and do your share of the work when working on a team. Do not be fearful of asking questions.

Students cannot use electronic devices during laboratories without permission. No laptops, electronic pads or telephones, please.

## Laboratory Attendance

Regular attendance in the laboratory course is mandatory. Your performance is directly related to the punctuality, consistency and quality of your attendance. Students with unexcused excessive absences (2 or more) can be dropped from the class.

Note: Laboratory experiments cannot be made up after the dates for which they are scheduled.

## Participation

A schedule of laboratory activities is included herein. Each student is responsible for the following:

- Reading the assigned modules before the lab
- Attending scheduled labs
- Assisting partners with group activities
- Performing individual activities
- Recording results in notebooks and/or worksheets
- Reviewing all laboratory material appropriately in preparation for lab exams.

## Laboratory Materials

Required:

The following materials may be purchased from the college bookstore:

- Sharpie® brand marker
- Bound composition notebook with sewn-in pages.
- For safety -- closed toe shoes and long hair tied up during laboratory

Recommended:

- Lab coat or apron
- Safety glasses if you wear contact lenses to the lab.

**Note:** Inoculating needles, loops and handles, slides, cover slips, and lens paper are furnished by the laboratory.

## Laboratory Grades

Grades for the laboratory portion of this course will be determined as described in the section entitled *Course Grades and Their Calculation*.

## Statement on Laboratory Safety

"Health and safety are paramount values in science classrooms, laboratories and field activities. Students are expected to learn, understand and comply with environmental, health and safety (EHS) procedures and protocols, and must agree to abide by the ACC science safety policy. Students are expected to conduct themselves with appropriate professional behavior and with respect and courtesy to all. Anyone who thoughtlessly or intentionally jeopardizes the health or safety of another individual will be immediately dismissed from the day's activity, may be withdrawn from the class, and/or barred from attending all activities. Specific safety information for each activity will be discussed at the beginning of the activity. For those activities that require specific safety training, a student who is late and misses the safety training will not be able to participate in the activity." The comprehensive science safety policy can be found at: [http://www.austincc.edu/sci\\_safe/](http://www.austincc.edu/sci_safe/).

## Additional ACC Policies

### Statement on Scholastic Dishonesty

"Acts prohibited by the college for which discipline may be administered include scholastic dishonesty, including but not limited to, cheating on an exam or quiz, plagiarizing, and unauthorized collaboration with another in preparing outside work. Academic work

submitted by students shall be the result of their thought, research or self-expression. Academic work is defined as, but not limited to, tests, quizzes, whether taken electronically or on paper; projects, either individual or group; classroom presentations; and homework.”

## **Statement on Students with Disabilities**

"Each ACC campus offers support services for students with documented physical or psychological disabilities. Students with disabilities must request reasonable accommodations through the Office of Students with Disabilities on the campus where they expect to take the majority of their classes. Students are encouraged to do this three weeks before the start of the semester. Students who are requesting accommodation must provide the instructor with a letter of accommodation from the Office of Students with Disabilities (OSD) at the beginning of the semester. Accommodations can only be made after the instructor receives the letter of accommodation from OSD.”

## **Statement on Academic Freedom**

"Institutions of higher education are conducted for the common good. The common good depends upon a search for truth and upon free expression. In this course the professor and students shall strive to protect free inquiry and the open exchange of facts, ideas, and opinions. Students are free to take exception to views offered in this course and to reserve judgment about debatable issues. Grades will not be affected by personal views. With this freedom comes the responsibility of civility and a respect for a diversity of ideas and opinions. This means that students must take turns speaking, listen to others speak without interruption, and refrain from name-calling or other personal attacks."

## **Additional Academic Resources**

### **Testing Center Use and Policies**

ACC Testing Center policies: <http://www.austincc.edu/testctr/>

### **Student Services**

- Student Support Services: <http://www.austincc.edu/support/>
- The ACC student handbook is now online as **the Need to Know** page: <http://www.austincc.edu/current/needtoknow/>

### **Instructional Services**

Instructional Services: <http://www.austincc.edu/cssisd/>

## Lecture Schedule - Biol 2420: Microbiology for Health Sciences Section 04755 (009)

8:05 P.M. to 10:00 P.M. room 1133

<b>WEEK OF:</b>	<b>Monday</b>	<b>Wednesday</b>
<b>May 28</b>	<b>No Class Yet</b>	Day 1 Welcome to Class! Handouts and Introduction - Topic 1
<b>June 4</b>	Microbial Study Methods (microscopy) - Topic 2	Prokaryotes - Topic 3
<b>June 11</b>	Eukaryotes - Topic 4	Viruses Topic 5
<b>June 18</b>	Nutrition, Ecology and Growth - Topic 6	Metabolism I - Topic 7
<b>June 25</b>	<b>Exam One</b>	Metabolism II - Topic 7 and ATP flow
<b>July 2</b>	Microbial Genetics - Topic 8 and RNA updates	<b>July 4 Holiday!</b>
<b>July 9</b>	Infection and Disease - Topic 9	<b>Exam Two</b>
<b>July 16</b>	Innate (non-specific)Resistance - Topic 10	Specific (Adaptive) Immunity - Topic 11 & 11a
<b>July 23</b>	Immunization & Immunological Disorders - Topic 12	Testing and Diagnostics - Topic 13 & 13a
<b>July 30</b>	<b>Exam Three</b>	TBD
<b>Aug 6</b>	TBD	TBD
<b>Aug 13</b>	<b>Exam Four</b>	<b>Class complete!</b>

**Tentative Bio 2420**  
**Lab Schedule - Microbiology for Health Sciences**  
**Section 04755 (009) -**

6:00 P.M. to 7.55 P.M. - room 1133

<b>WEEK OF:</b>	<b>Monday</b>	<b>Wednesday</b>
<b>May 28</b>	<b>No Class Yet</b>	Introduction and Safety Guidelines 1-1 Nutrient Agar and Broth 2-1 Ubiquity of Microorganisms
<b>June 4</b>	3-1 Introduction to the Light Microscope 3-3 Examination of Eukaryotic Microbes 1-2 Aseptic Transfers 2-3 Growth Patterns in Broth 4-1 Streak Plate Method of Isolation*	2-2 Cultural Characteristics 3-4 Simple Stains 3-12 Begin (Morphological) <b>Unknown #1</b>
<b>June 11</b>	3-5 Negative Stain 3-6 Gram Stain and 3-8 Capsule Stain 3-12 Continue <b>Unknown #1</b> (Gram Stain)	3-7 Acid-fast Stain 3-9 Endospore Stain 3-12 Continue <b>Unknown 1</b> (Differential Stains)
<b>June 18</b>	2-6 Cultivation of Anaerobes 6-1 Standard plate count (demo) 2-9 Effects of Osmotic Pressure, temperature, radiation on Growth 3-12 Continue <b>Unknown #1</b>	<b>Lab Practical Exam One</b> <b>Unknown #1 DUE!</b>
<b>June 25</b>	4-3 Phenylethyl Alcohol Agar (PEA) 5-26 Blood Agar Plate 4-2 Mannitol Salt Agar (MSA) 5-5 Catalase Test (H <sub>2</sub> O <sub>2</sub> ) 5-27 Coagulase Test Begin Gram (+) <b>Unknown #2</b> (streak for isolation)	5-12 Bile Esculin Test 5-24 Bacitracin Susceptibility Test Optichin Susceptibility Test Continue Gram (+) <b>Unknown #2</b>
<b>July 2</b>	4-6 Eosin Methylene Blue Agar (demo with E. coli) 4-7 Hektoen Enteric Agar 4-8 McConkey Agar Continue Gram (+) <b>Unknown #2</b>	<b>July 4 Holiday!</b>

<b>WEEK OF:</b>	<b>Monday</b>	<b>Wednesday</b>
<b>July 9</b>	<p align="center"><b>Lab Practical Exam Two</b></p> Continue Gram (+) <b>Unknown #2</b> Begin (Enteric) <b>Unknown #3</b> Rapid ID Demo	5-2 Phenol Red Broth 5-4 Methyl Red / Voges-Proskauer Tests (MR-VP) 5-8 Citrate Test 5-20 Sulfur, Indole, Motility (SIM) 5-21 Triple Sugar Iron Agar(TSI) Continue <b>Unknown #3</b> <b>Unknown #2 DUE!</b>
<b>July 16</b>	5-15 Urease Test 5-10 Ornithine Decarboxylase Test, Continue <b>Unknown #3</b> 5-31 Begin <b>Mixed Unknown #4</b>	<p align="center"><b>Lab Practical Exam Three</b></p> Continue <b>Unknown #3,</b> <b>Unknown #4</b>
<b>July 23</b>	10-1 The Fungi-Common Yeasts and Molds and Fermentation of Grape Juice 10-2 Protozoans of Clinical Importance Continue <b>Unknown #4</b> <b>Unknown #3 DUE!</b>	10-2 Protozoans of Clinical Importance Helminth Parasites Continue <b>Unknown #4</b>
<b>July 30</b>	Helminth Parasites Continue <b>Unknown #4</b>	<p align="center"><b>Lab Practical Exam Four</b></p> <b>Unknown #4 DUE!</b>
<b>Aug 6</b>	<b>No Class - Lab complete!</b>	