Syllabus for
BIO 310—Microbiology Laboratory
1.0 Credit Hours
Spring 2003

I. COURSE DESCRIPTION

An introduction to microbiology lab techniques including isolation, cultivation, characterization, and identification of micro-organisms. (Two 2-hour lab periods per week.)
Corequisite: BIO 310 Lecture.
Lab fee: $35.00.

II COURSE GOALS

The purpose of this course is to enable the student to learn laboratory techniques and participate in experiments.

II. COURSE OBJECTIVES

As a result of successfully completing this course, the student will be able to do the following:

1. Prepare slides of microorganisms from different source materials.
2. Perform the staining procedures included in this course and obtain satisfactory results.
3. Isolate and identify microorganisms in pure culture.
4. Perform serial dilutions to quantify and enumerate bacteria.
5. Determine the morphological, nutritional, and physiological characteristics of an organism by using the standard tests in the laboratory manual.
6. Describe the importance of microbiological techniques in human diagnosis of infectious disease.
7. Describe three (3) applications of microbiological techniques in human life and environment.
8. Demonstrate ability to use Bergey's Manual of Determinative Microbiology, to identify microorganisms.
9. Quantify bacterial growth using a spectrophotometer.
10. Demonstrate the effectiveness of certain antibiotics.
11. Demonstrate effect of osmolarity and pH on growth of bacteria.
12. Recognize and identify stages in viral infection of bacteria.
13. Utilize effectively the compound microscope and explain fully the mechanisms of its operation.

VI. TEXTBOOK

A. Required Textbooks

Kerr, T.J. and McHale, B.B. 2001. Applications in General Microbiology: A Laboratory Manual. Winston-Salem: Hunter Textbooks. 395 p.

B. Optional Textbooks

Leboffe, M.J. and Pierce, B.E. 1999. A Photographic Atlas for the Microbiology Laboratory, 2nd ed., Englewood, CO: Morton Publishing. 186 p.

V. POLICIES AND PROCEDURES

A. University Policies and Procedures

1. Attendance at each class or laboratory is mandatory at Oral Roberts University.
2. Double cuts will be assessed for absences immediately preceding or following holidays.
3. Excessive absences can reduce a student's grade or deny credit for the course.
4. Students taking a late exam because of an unauthorized absence will be charged a late fee.
5. Students and faculty at Oral Roberts University adhere to all laws addressing the ethical use of others' materials, whether it is in the form of print, video, multimedia, or computer software.
6. Final exams cannot be given before their scheduled times. Students need to check the final exam schedule before planning return flights or other events at the end of the semester.

B. Course Policies and Procedures

1. Grading

Eleven (11) quizzes (20 points each) are in the laboratory during the semester. **No make-up quizzes are given**. The lowest quiz score is dropped and the points totaled. 200

Two (2) laboratory reports*	80
Midterm examination	100
Practical examination	100
Unknowns	250
General laboratory techniques (Neatness and cooperation)	20
Comprehensive examination	100
	850

* Due one week from day of starting and to be done on exercise indicated by lab instructor.

2. Exam Policies

a. *Makeup Exams*—Any examination not taken at the scheduled time due to an excused absence must be made up at a time arranged with or by the instructor. Generally, tests missed for an unexcused absence cannot be made up. If a test absence is allowed to be made up, the University late test fee must be paid in advance.

b. *Final Exam*—The final exam is NOT optional. ORU requires that a final exam be taken at the scheduled time, unless written permission from an authorized person is received; otherwise, makeup of an exam should be scheduled in advance of the exam.

3. Other Information

a. *Scheduled Meetings*— Two 2-hour laboratory meetings are scheduled per week. Usually not all of this time will be needed; however, there are a few instances in which the students need to come in at times

other than the regularly scheduled time to evaluate their experiments.

b. *Assignments*: The laboratory exercises are performed according to the schedule listed below. It is important for each student to read the material pertinent to the laboratory exercise before the laboratory period.

c. *Incompletes*: An Incomplete ("I") is given for work that is incomplete at the time final grades are given due to circumstances beyond the student's control. It is the student's responsibility to personally submit to his or her instructor a written petition for an "incomplete" before final exam week and receive back written approval. If granted, the student must make up the incomplete work within one semester, or the "incomplete" automatically becomes an "F." Incompletes are not granted to students who have procrastinated or otherwise neglected the course by absences, late work, etc.

d. No laboratory experiments may be omitted. Excused absences made up by making arrangements with the instructor. If a student misses six or more labs, a grade of "F" is automatically given.

VI. COURSE CALENDAR

PERIOD		**EXERCISE**	
1	Th	Lee Notes	Introduction Bacteria in Natural and Laboratory Environments
2	T	Ex. 1	Introduction to the Microscope
3	Th	Ex. 2	Ocular and Stage Micrometers
4	T	Ex.4	Isolation of Pure Cultures
5	Th	Ex. 6 Ex. 7	Simple Staining and Bacterial Morphology Differential Staining: Gram
6	T	Ex. 7 Ex. 8	Continued: Acid Fast Special Staining Techniques: Capsule
7	Th	Ex. 8 Ex. 9	Continued: Spore Motility of Bacteria
8	T	Ex. 11 Ex. 12	Anaerobic Bacteria Minimum Growth Requirements
9	Th	Ex. 24 Ex. 25	Effects of Ultraviolet Light Effects of Organic Material on Antiseptics and Disinfectants
10	T	Ex. 22	Effects of Temperature on Microorganisms

PERIOD		EXERCISE	
11	Th	Ex. 23 Ex. 27	Effects of Osmotic Pressure and pH Antibiotic Susceptibility Testing
12	T	Ex. 13	Bacterial Enumeration
13	Th	Ex. 17	Intracellular Enzymes
14	T	Ex. 16	Extracellular Enzymes
15	Th	Ex. 34	Bacteriophage: Demonstration
16	T		Review
17	Th		Midterm
			SEMESTER BREAK
18	T	Ex. 15	Selective and Differential Media
19	Th	Ex. 18	Carbohydrate Utilization
20	T	Ex. 20	Biochemical Reactions
21	Th	Ex. 19 Ex. 20	IMVIC Tests Complete
22	T		Review
23	Th		Lab Practical Comprehensive Exam
24	T	Ex.21	Start Unknowns
25	Th		Unknowns
26	T		Unknowns
27	Th		Unknowns
28	T		Unknowns
29	Th		Unknowns Due

VII. ASSESSMENT SUMMARY

Dr. John Nelson
Name of Instructor

MISSION

The lifestyle at ORU is rooted in the word "Wholeness." ORU seeks to educate the whole person, with balanced emphasis placed on development of mind, spirit, and body.

GENERAL OUTCOMES

1. Spiritual Development
2. Physical Development
3. Communication
4. Analysis
5. Problem Solving
6. Valuing in Decision Making
7. Social Interaction
8. Global Perspectives
9. Effective Citizenship
10. Aesthetic Responsiveness

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MAJOR OUTCOMES

Analysis/Problem Solving

Be proficient in biology by acquisition of a broad-based knowledge in biology and by the development of scientific skills.

Be equipped to do independent investigation, analysis, and evaluation of a scientific nature.

Communication

Be able to effectively communicate science in written and oral format.

Global Perspective/Spiritual Development

Be able to develop a scientific worldview consistent with Biblical truth.

Microbiology Lab
Title of Course

COURSE GOALS

Utilize aseptic techniques properly.

Isolate and determine identity of microorganism from unknown culture.

Determine specified environmental effects on microorganisms.

Determine the presence of microorganisms within our environment.

Determine morphological, nutritional, and physiological characteristics of an organism.

Describe importance of microbiological techniques in human diagnosis, disease, and treatment.

Biology
Name of Department

ASSESSMENT OF COURSE GOALS

STIMULI

Midterm and Final Exams
Regular Quizzes

Lab Reports
General Lab Techniques

Unknown

CRITERIA

Accurate results on unknown

Use of scientific method in writing of lab reports

Absence of contamination in cultures