Syllabus for

BIO 457–Principles of Immunology Laboratory

1.0 Credit Hours

Spring 2001

I. COURSE DESCRIPTION

Designed to allow students the opportunity to utilize the theories and concepts of Immunology in practical, experimental projects. Emphasizes techniques involving serial dilutions, precipitations and agglutination reactions, nitrocellulose and gel electrophoresis, gel diffusion, isolation and identification of B-lymphocytes and T-lymphocytes, immunoaffinity-based procedures and practice problem solving.
Prerequisites: A grade of "C" or better in BIO 310 lecture and lab or BIO 411 lecture and lab.
Corequisite: BIO 457 Lecture.
Lab fee: $25.00

II. COURSE GOALS

Immunology Laboratory is a corequisite to Immunology (BIO 454-01) and supports the goals of the latter in understanding and integrating the mechanisms involved in the immune response to bacteria, fungi, viruses, protozoa, and other foreign substances. This course equips the student with the skills to assess molecular and cellular components of the immune system both qualitatively and quantitatively. It provides the student with a basis for doing independent research utilizing techniques that are current with modern technology.

III. COURSE OBJECTIVES

As a result of successfully completing this course, the student will be able to demonstrate a practical knowledge of equipment and procedures common to immunological experimentation and analysis as well as be able to perform a variety of immunological assays.

IV. TEXTBOOKS

Required Textbook

Myers R. L. Immunology: A Laboratory Manual, 2nd edition, Wm. C. Brown Publishers, Dubuque, IA 52001. 1995.

V. COURSE 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 exam 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. Evaluation Procedures

1. Grading system
   a. No exams are given. Lab material will be included on examinations given in lecture.
   b. A detailed log is required. (See below)
   c. Quizzes are given prior to each new lab exercise to assess the student's preparation for that exercise.
   d. Lab reports: students are evaluated on their ability to clearly record data and interpret/analyze these data as instructed by the lab manual and the professor.

2. Grading

Notebook	1 x 50	=	50
Lab reports	10 x 10	=	100
Quizzes	10 x 10	=	100
	Total		250

C. Other Information

1. Laboratory Conduct and Clean-up
   This laboratory involves the use of several pieces of expensive equipment, and the techniques are delicate. Part of a laboratory experience is proper care of equipment and good dexterity. It is expected that the student demonstrate professional behavior both in use of equipment and attitude.
2. Laboratory Attendance and Makeup work
   a. Philosophy
      Enrollment in Immunology Laboratory is a commitment by the student to all of the assignments, schedules, and requirements of the course. It is expected that the student will honor this commitment.
   b. Policy
      1. There are **no** automatically excused absences.
      2. Work missed due to unexcused absences **cannot** be made up.
3. Log Guidelines
   Students need to follow these guidelines:
   a. Use bound lab book 10 1/8 x 7 7/8 with grid lines.
   b. Do not enter lab notes.
   c. Enter only experimental protocol as it was actually done. **Exact** quantities, dilutions, sequences, times, measurements must be recorded during lab period. Be particularly careful to note any deviations, intended or otherwise, from the experimental protocol as described in the lab manual.
   d. Record results and data and conclusions.

VI. COURSE CALENDAR

Week(s)		Exercise
1	Ex. 1	Vaccination – a Semester Project
	Ex. 2	The Dilution Concept
2	Ex. 5	Precipitation
3	Ex. 6	Precipitation Curve
4	Ex. 7 & 8	Agglutination and Commercial Agglutination
5	Ex. 10	Gel Diffusion
6	Ex. 11	ELISA
7	Ex. 11	ELISA (cont'd)
8	Ex. 12	Affinity Chromatography
		SPRING BREAK
9	Ex. 13	SDS-PAGE
10	Ex. 14	Western blotting
11		Western blotting (cont'd)
12	Ex. 16 & 17	Identification of B- and T-lymphocytes
13		Identification of B- and T-lymphocytes (cont'd)
14	Ex. 21	Immunoelectrophoresis

VI. ASSESSMENT SUMMARY

Steffan G. Anderson
Name of Instructor

BIO 457-61
Course No.

Principles of Immunology Lab
Title of Course

Biology
Name of Department

MISSION

The lifestyle at ORU is rooted in the word "Wholeness." ORU seeks to educate the whole person, with balanced emphasis placed on the 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

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.

COURSE GOALS

To prepare and interpret serial dilution.

To set up, perform, and interpret precipitation reactions.

To utilize commercial to detect and to interpret antigen-antibody agglutination reactions.

To set up, perform, and interpret gel immuno-diffusion tests.

To set up, perform, and interpret SDS-PAGE and immunoaffinity-based assays such as Western blotting and ELISA.

To quantitate immune cellular components.

To keep an accurate log of experimental procedures performed.

ASSESSMENT OF COURSE GOALS

STIMULI

Two comprehensive exams

5 quizzes

Log

CRITERIA

Satisfactory scores on exams, quizzes, and log.