

MICRO 140 GENERAL MICROBIOLOGY LABORATORY

02

TR, 10:00 am – 11:40 am (60190)

INSTRUCTOR:	Ingelia White Ph.D.
OFFICE:	Imiloa 102
OFFICE HOURS:	TR, 9:00 am – 10:00 am, or by appointment
TELEPHONE:	236-9102
EFFECTIVE DATE:	Spring 2014

WINDWARD COMMUNITY COLLEGE MISSION STATEMENT

Windward Community College offers innovative programs in the arts and sciences and opportunities to gain knowledge and understanding of Hawai'i and its unique heritage. With a special commitment to support the access and educational needs of Native Hawaiians, we provide O'ahu's Ko'olau region and beyond with liberal arts, career and lifelong learning in a supportive and challenging environment — inspiring students to excellence.

CATALOG DESCRIPTION

Laboratory course illustrating fundamental techniques and concepts of microbiology, such as microscopic observations, aseptic transfer, microorganism classification and identification, environmental factors influencing microbial growth, biochemistry of microorganisms, ecological microbiology, and medical microbiology. This course is designed to complement MICRO 130. Primarily for students in nursing, dental hygiene, biotechnology, ethnopharmacognosy, and nutrition.

WCC: AA (DY), CA Agripharmatech

Activities Required at Scheduled Times Other Than Class Times

1. Read assigned Modules (discussion part) prior to class sessions
2. Write lab reports in scientific format right after the module is completed (see Lab Report Outline)

STUDENT LEARNING OUTCOMES

1. Operate equipment used in microbiology laboratory
2. Prepare growth media
3. Perform aseptic transfer
4. Identify microorganisms using morphological and physiological tests
5. Follow biosafety procedures
6. Produce lab reports using the standard scientific format

COURSE TASKS

You will demonstrate knowledge and understanding of the theories and principles of microbiology laboratory methods in the following topic areas: microscopy (use of the microscope, slide preparation, staining, etc.), classification of microorganisms (e.g., bacteria, and fungi), aseptic culture methods (media preparation, aseptic transfers, isolation, culture maintenance, etc.), environmental influences (e.g., temperature, ultraviolet light, antiseptics, disinfectants, and antibiotics), biochemical activities of microorganisms (e.g., fermentation, nitrate reduction, hydrogen sulfide production, dehydrogenase activity, urease activity, exoenzyme activity, etc.), ecological microbiology (e.g., analyses of coliforms from natural waters), and isolation/identification of microorganisms.

You will also demonstrate the acquisition of microbiology laboratory skills by (1) the establishment and proper maintenance of stock cultures throughout the semester and (2) the identification of bacterial unknowns.

STUDENT RESPONSIBILITIES

You should carefully review the attached sheet detailing the inherently dangerous activities of this course and sign the appropriate U.H. Assumption of Risk and Release and Medical Consent forms.

You are expected to attend all laboratory sessions and participate in all activities, working in groups, and complete all course assignments on time.

You are expected to be prepared in advance when you arrive at class. Being prepared includes the following: having already read text materials (e.g., lab manual: discussion part, and handouts) assigned for that day's activities; and bringing required work materials (pen, colored pencils, lab manual). You also need to purchase a lab coat, a goggle, masks and gloves.

Any changes in the course schedule, such as examination dates, deadlines, etc., will be announced ahead of time in class. It is your responsibility to be informed of these changes.

HOW TO SUCCEED IN THIS CLASS

Understanding microbiology involves understanding many difficult concepts and vocabulary from many science disciplines, not just knowing facts. You should know that the details of these concepts are important. In addition, you will be introduced to hundreds of new words. In some cases, words that are familiar to you in a context other than biology will be introduced to you. However, you will need to understand and use these terms in a biological context.

You should take careful pre-lab notes and read the corresponding material in the lab manual (especially the Discussion part), and handouts. As soon as possible (best if you do it the same day), copy your notes filling in gaps and missing information by referring to the handouts and textbooks. You should carefully review these rewritten notes as often as possible.

ASSESSMENT TASKS AND GRADING

The evaluation of the student's achievement of the course objectives will be based upon laboratory participation, the ability to do microorganism cultures, the ability to identify

microorganisms, laboratory reports, and examinations as described below (see Embedded Assessment hand-out).

Laboratory Participation

You will actively participate in all lab activities (10 points). You are also expected to work in groups, safely and efficiently in the laboratory. Thus you will be graded on laboratory attendance, level of participation, and laboratory work habits. Because of the difficulties in setting up laboratory materials, students missing a regularly scheduled laboratory activity cannot be given an alternative assignment to the activity. Failure to participate in a scheduled laboratory session, or its approved make up activity, will result in a **3 POINT DEDUCTION** for each session missed (without doctor's note or formal notification).

Laboratory Reports

You will complete a total of four written formal laboratory reports (80 points). Each lab report consists of modules assigned for specific lab periods. Lab reports should include diagrams or drawings of colony morphology (shapes, margins, elevations) on agar plates, microbial shapes through microscopic observations, bacterial growth patterns in liquid cultures, hemolysis and chromogenesis results. All reports are kept in a folder, must be completed and turned in on time on exam days.

Microorganism Cultures

You will aseptically transfer and maintain cultures of bacteria using procedures learned in this laboratory course. Assessment will be based upon results of non-contaminated cultures at the end of the semester (10 points).

Identification of Bacterial Unknowns

Using methods learned in this course (e.g., colony characteristics, cellular characteristics, differential staining and growth in differential), you will identify different kinds of unknown bacteria (50 points).

Unit Examinations

You will take a total of four written examinations, including final exams (100 points each) to assess your knowledge and understanding of previous laboratory activities (non cumulative). One or two questions from lectures or home-work assignments may be included.

METHOD OF GRADING

The assignment of points will be as described by the following protocol:

Laboratory participations (all sessions)	10 points
Cumulative lab reports (4)	80 points
Microorganism culture (not contaminated)	10 points
Bacteria identification (1)	50 points
Examinations (4)*	400 points

Total	550 points

* Format of exams: Multiple choice, Fill in the blank, and Essay.

Letter grades will be assigned as follows:

- A - - - 90% or above in total points.
- B - - - 80-89% of total points.
- C - - - 65-79% of total points.
- D - - - 55-64% of total points.
- F - - - Below 55% of total points; or incomplete official withdrawal from course.
- I - - - Incomplete; given at the **INSTRUCTOR'S OPTION** when you are unable to complete a small part of the course because of circumstances beyond your control. It is **your responsibility** to make up incomplete work with a minimum level (or better) of achievement. Failure to satisfactorily make up incomplete work within the appropriate time period will result in a grade change for "I" to the contingency grade identified by the instructor (see catalog).
- CR - - 65% or above in total points; you must indicate the intent to take the course as **CR/NC** and audit options in writing by March 20, 2014 (see catalog).
- NC - - Below 65% of total points; for MICRO 140, this grade is only available under the **CR/NC** option (see above and see catalog); the NC grade will not be used as an alternative grade for an "F".
- N - - - **NOT GIVEN BY THIS INSTRUCTOR EXCEPT UNDER EXTREMELY RARE CIRCUMSTANCES** (e.g., documented serious illness or emergency that prevents you from officially withdrawing from the course); never used as an alternative for an "F" grade;
- W - - - Last day to withdraw without a "W (withdrawal)" grade is February 3, 2014, Last day to withdrawal with "W" grade is March, 2014 (see catalog).

Waiver of minimum level of achievement will be given only in unique situations at the instructor's discretion. Students involved in academic dishonesty will receive an "F" grade for the course.

"If you have a physical, sensory, health, cognitive, or mental health disability that could limit your ability to fully participate in this class, you are encouraged to contact the Disability Specialist Counselor to discuss reasonable accommodations that will help you succeed in this class. Ann Lemke can be reached at 235-7448, lemke@hawaii.edu, or you may stop by Hale 'Akoakoa 213 for more information".

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LEARNING RESOURCES

- Beisher, L., 1996. *Microbiology in practice: a self-instructional laboratory course*. 6th edition. HarperCollins Publishers, Inc., New York, New York.
 - White, I. 2013. Ethnopharmacognosy Series IV – Pharmaceutical and Nutraceutical Values of Spanish Needle. Windward Community College.
- Hand-outs will be provided

My websites:

http://windward.hawaii.edu/people/Ingelia_White/

http://windward.hawaii.edu/Academics/Agripharmatech_CA/

Micro 140 Lab Schedule
 Spring 2014
 Instructor: Ingelia White PhD.

<u>Date</u>	<u>Lab activities</u> *	<u>Modules</u>
14-Jan	Introduction	Hand-outs
16-Jan	Balance	1
21-Jan	Preparing and dispensing media	2
23-Jan	Aseptically dispensing agar into Petri dishes	9
28-Jan	Compound microscope	4
30-Jan	Preparing a wet mount	5
4-Feb	Ubiquity of microorganisms, Aseptic transfer	6, 7
6-Feb	Serological pipette	8
11-Feb	EXAM #1	
13-Feb	Loop inoculating pour plates	10
18-Feb	Quebec colony counter & wine making	11, 15
20-Feb	Steaking and cultural characteristic of bacteria	12, 13
25-Feb	Anaerobs & microaerophils, effect of temperature	28,29
27-Feb	U.V. radiation	30
26-Feb	Smears, simple stain	21, 22
4-Mar	Gram stain	23
6-Mar	EXAM #2	
11-Mar	Capsule stain, endospore stain	24, 25
13-Mar	Acid Fast stain, exoenzymes	27, 33
18-Mar	Carbohydrate test	34
20-Mar	Nitrate reduction test	35
25-Mar	Spring Recess (March 24 - 28)	
1-Apr	Urea hydrolysis	36
3-Apr	Dental caries susceptibility	53
8-Apr	Observation	
10-Apr	EXAM #3	
15-Apr	Intestinal pathogens, S. aureus ID	49, 50, 51
17-Apr	Intestinal pathogens continued	49, 50,51
22-Apr	Unknown bacteria ID	56
24-Apr	Unknown bacteria ID continued	56
29-Apr	Unicellular fungi, filamentous fungi	15, 16
1-May	Effects of disinfectants, antiseptics, antibiotics	31, 32
6-May	Observation	
13-May	FINAL EXAM	

* Schedule of activities/days might be changed slightly