MICR 140 GENERAL MICROBIOLOGY LABORATORY

(CRN63049, 2 credits)
TR 10:00 – 11:40 am, Hale Imiloa 106

INSTRUCTOR: Hongwei Li, Ph.D.
OFFICE: Hale Imiloa 107
OFFICE HOURS: Thursday, 12:30 – 1:30 pm, or by appointment
TELEPHONE: 236-9104 **EMAIL:** hli@hawaii.edu

EFFECTIVE DATE: Fall 2016

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 Other Than Class Times

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

STUDENT LEARNING OUTCOMES

- Operate equipment used in microbiology laboratory
- Prepare growth media
- Perform aseptic transfer
- Identify microorganisms using morphological and physiological tests
- Follow biosafety procedures
- Produce lab reports using the standard scientific format

COURSE TASKS, ASSESSMENTS AND GRADING

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 a group, and complete all course assignments on time.
- You are expected to be prepared in advance when you arrive at class. Being prepared includes the followings: 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.

Assessments

- ***Laboratory Participation***
  You are required to actively participate in all lab activities, and expected to work in groups, safely and efficiently in the laboratory. You will be graded on laboratory attendance, level of participation, and performance in laboratory practices. Because of difficulties in setting up laboratory materials, some scheduled laboratory activities cannot be given an alternative assignment for making up if you miss those labs. Failure to participate in a scheduled laboratory session, or its approved make-up activity, will result in a **5 POINT DEDUCTION** for each session missed (without doctor's note or formal notification).

- ***Laboratory Reports***
  A laboratory report should contain following sections, *Title, Introduction, Procedure, Results,* and *Discussion/Conclusion*. The section *Results* may include diagrams or drawings of colony morphology (shapes, margins, elevations) on agar plates, microbial shapes through microscopic observations, bacterial growth patterns in liquid cultures, result from physiological tests. All reports are kept in a folder, must be completed after each lab session and turned in on exam days.

- ***Identification of Unknown Bacteria***
  Using methods learned in this course (e.g., colony characteristics, cellular characteristics, differential staining, features of growth and physiological reactions) to identify unknown bacteria.

- ***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.

- ***Exams***
  There are a total of four written exams (three midterms and one final), and the format of exams includes Multiple Choice, Fill-in-the-blank, Matching and Essay. Make-up exam will be permitted only when there is a legitimate excuse (such as illness or emergency; doctor's note is required). ***No early or make-up exam for the final.***

Grading

- The total possible points:

Laboratory participations	100 points
Lab reports	100 points
Bacteria identification	50 points
Microorganism Cultures	50 points
Exams (3)	300 points
Total	600 points

- Grading is based on the percentage of total points earned. Final Grades will be assigned as follows:

A	90 – 100%	B	80 - 89%	C	70 - 79%
D	60 - 69%	F	0 - 59%		

I (incomplete) grade is given at the instructor's option when a student has failed to complete a small part of a course because of circumstances beyond his or her control. It is **your responsibility** to make up the 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).

LEARNING RESOURCES

Lab materials: https://laulima.hawaii.edu/portal

Reference text:

- Beisher, L., 1996. *Microbiology in practice*: *a self-instructional laboratory course.* 6th edition. HarperCollins Publishers, Inc., New York, New York.
- Cappuccino et al., 2014. Microbiology: a laboratory manual. Pearson, 10th edition.

DISABILITIES ACCOMMODATION STATEMENT

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.

MICR140 Lab Schedule

Fall 2016

Date	Lab activities	Lab#
Aug. 23	Introduction and biosafety	1
Aug. 25	Ubiquity of microorganisms	2
Aug. 30	Aseptic transfer of bacteria	3
Sep. 1	Compound microscope	4
Sep. 6	Preparing a wet mount	5
Sep. 8	Preparation of smears and simple staining	6
Sep. 13	Gram staining	7
Sep. 15	Acid fast staining	9
Sep. 20	Capsule stain and endospore staining	10
Sep. 22	Preparing and dispensing media /wine making	11
Sep. 27	**Exam 1** (Lab 1-10)	
Sep. 29	Streak plate and cultural characteristics of bacteria	12
Oct. 4	Serial dilution of bacterial culture and spread plate	13
Oct. 6	Oxygen and the bacterial growth	14
Oct. 11	Effects of temperature on bacterial growth and U.V. radiation	15
Oct. 13	Effects of disinfectants, antiseptics, antibiotics	16
Oct. 18	Bacteria transformation	17
Oct. 20	Exoenzymes	18
Oct. 25	**Exam 2** (Lab 11-17)	
Oct. 27	Carbohydrate test	19
Nov. 1	Urea hydrolysis and Nitrate reduction test	20
Nov. 10	Dental caries susceptibility	21
Nov. 15	Bacteria on skin and in throat	22
Nov. 17	Bacteria in the intestinal Tract	23
Nov. 22	Identification of unknown bacteria	24
Nov. 29	Identification of unknown bacteria	25
Dec. 1	Identification of unknown bacteria	26
Dec. 6	Identification of unknown bacteria	27
Dec. 8	Fungi	28
Dec. 13	**Final Exam** (Lab18-28, 10:00am - 12:00pm)	