BI-250L Microbiology and Cell Biology for Nursing

Instructor:	Angelique Showman			
Section:	*-01*	Th	14:30 – 17:20	Henry Hall L10
	-02	M	13:30 – 16:20	Henry Hall L7
	-04	W	18:00 – 20:50	Henry Hall L7
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Office Hours:	TBA			
Lab Manual:	Lab notebook and information posted on eCollege			

Course Description:

Concurrent registration in BI 250 lecture is required. The lab section is designed to enhance your understanding of scientific methods and concepts by bringing a practical understanding of microbiology and cell biology through hands-on experience in different techniques.

Safety Requirements:

Students are ***required*** to practice safety precautions to include wearing safety glasses; closed toed, full-coverage shoes; and lab coats while performing experiments. Long pants are recommended. If you have long hair, it is recommended to tie it back away from the face but required when we are using Bunsen burners (long pony tails are not authorized). Working in a lab can be messy, so consider wearing very casual attire in case it gets soiled during laboratory work. Only registered students will be allowed in the laboratory. For your safety, food and drink including chewing on gum or candy is **NOT** permissible in the lab. Avoid applying cosmetics or touching your hands to your face anytime you are in lab.

Course Requirements:

A scientific hand-held calculator with log function.
Access to Word/Excel or other word processing and spreadsheet program.
Bound Lab Notebook (no 3-ring binders or spiral notebooks)
eCollege (chaminade.ecollege.com)
Twitter.com

Course Recommendations:

iPad or other tablet device (certain iPad apps will be recommended through the course; those using any other tablet device will have to search for alternatives to these apps. Please come see me and I can attempt to help, but I may be incompatible with non-Apple devices.)

Prerequisites:

BI 151/151L and BI 152/152L.
MA 107 or equivalent with grade of C or better.

Student Conduct:

Please refer to the Student Handbook for the CUH policies on Classroom Behavior and Academic Dishonesty.

Music Devices and Cell Phones:

The use of music devices, cell phones, smart phones, PDAs (personal digital assistant), pagers or any other electronic device with the potential to make noise is prohibited during lab. **Headphones are not permitted; wearing headphones in lab is a safety issue!** These devices must be turned off or placed on silent (not vibrate) during the entire lab time. During quizzes/exams, these devices need to be turned off and stored with the instructor until completion of the quiz/exam. If during a quiz/exam, your electronic device makes noise (this includes vibrating), you may be asked to turn in your exam for a grade of zero and leave the room while the rest of the class finishes. The use of any other electronic device other than an approved scientific calculator during the quiz/exam will be considered a form of academic dishonesty and will result in a failing grade for that assignment. Students who cannot comply with this rule will be asked to leave class. Please refer any questions to the Dean of Natural Sciences and Mathematics. All this being said, sometimes you will be permitted to use the camera on your phone or if you have a tablet, certain apps will be allowed; however, this is a privilege and anyone caught doing anything other than lab work on these devices will ruin it for everyone and lose participation points for that lab. If you are interested in going paperless and have a tablet device, see me for instructions.

Title IX:

Chaminade University of Honolulu recognizes the inherent dignity of all individuals and promotes respect for all people. Sexual misconduct will NOT be tolerated at Chaminade University of Honolulu. If you have been the victim of sexual misconduct, we encourage you to report this matter promptly. As a faculty member, I am interested in promoting a safe and healthy environment, and should I learn of any sexual misconduct, I must report the matter to the Title IX Coordinator. Should you want to report to a confidential source you may contact the following:

Counseling Center | 808-735-4845 |

Any priest serving as a sacramental confessor or any ordained religious leader serving in the sacred confidence role. | 808-735-4774 |

ADA Accommodations:

Students with special needs who meet criteria for the Americans with Disabilities Act (ADA) provisions must provide written documentation of the need for accommodations from the CUH Counseling Center (Dr. June Yasuhara; phone 735-4845) by the end of week three of the class, in order for the instructor to plan accordingly. Failure to provide written documentation will prevent your instructor from making the necessary accommodations. Please refer any questions to the Dean of Students and review the procedures at http://www.chaminade.edu/student_life/sss/counseling_services.php.

Attendance:

Attendance during all labs is **REQUIRED**. An excess of more than one (1) absence is unacceptable and will result in a non-passing grade in the course; there is no make-up assignment for lab experiments; however, you are still responsible for understanding the lab experiment you missed, as you will be tested on it. Under exceptional circumstances, alternative assignments in addition to the lab write-up may be available with a written request accompanied by a written verification for the reason of the absences. Experimental results will be provided by the instructor and consists of the raw data only, which can be used to complete the results, questions, and discussion portions of your lab-write up. The objectives, materials, hazards, and procedure can be completed with the information found in the laboratory handouts.

Course Expectations:

Students are expected to set up and perform microbiology-based experiments, while adhering to laboratory safety precautions set forth. Most experiments include a lab handout with pre-lab questions, which will be written in the lab notebook. Lab notebooks will be graded throughout the semester. In addition, to be prepared for lab, a written procedure will need to be written before lab. Both of these will be checked at the beginning of the lab. Failure to complete the pre-lab assignments indicates that the student is not prepared for lab and may not be allowed to proceed with the experiment; this will result in the loss of participation points for that day. There will also be two lab quizzes/practicals and a lab final/practical.

Additionally, students will be required to complete one lab report as a group project; participation as rated by the students in your group will be factored in to your final grade. Drafts with be turned in throughout the semester. The lab report will focus on a Service Learning project involving Hawaiian Medicinal Plants. As this is a college course, you are required to use a computer equipped with Word, Excel or other word processing/spreadsheet software. Lab reports are to be typed and include tables and figures as appropriate; hand written lab reports will not be accepted. Lab reports will be turned in via eCollege in a Word document format (.doc or docx) or Pages format; figures and tables can be turned in as either PDFs or Excel formats (.xls or xlsx) if you do not know how to embed them in the word-processing document (or you can come see me and I am happy to show you how) but they must still be titled and listed in the lab report document. **If the lab report is sent to me in a different format than above and I have to request a new document, it will be considered late and points will be deducted.**

Lab Report:

Lab reports/drafts will have the following format (some additional information has been included here but we will go into more details as we get into the project):

Abstract – brief summary of the experiment including results

Introduction – an introduction into the experiment, the theory behind it and state the hypothesis (citations required). The introduction will include background information about the cultural and medicinal uses of the plants and the link between health of the plant and the plant microbiome.

Methods and Materials – briefly what you did and used to conduct the experiment.

Results – tables and figures of the result and a short paragraph stating the results.

Discussion/Conclusion – explanation of the results in relation to the hypothesis; discussion of anything that occurred outside of what was expected. Additionally, relating the plant microbiome as an analogue to the gut microbiome will be included as well as conclusions of how the cultural and medicinal practices of these plants will help you treat your future patients.

Lab Notebook:

The lab notebook is where all notes, raw data and calculations for experiments will be documented; as well as, who participated in the experiment and when the experiment occurred. Pre-lab and Post-lab questions will also be answered in the lab notebook. Lab notebooks must be bound and pages numbered, must include a title page [Date(s) of Experiment, Description of Experiment, Page Number(s)] and written in blue or black permanent ink; however, since some drawing will be required, pencil will be allowed only during the lab period and colored pencils recommended but only for drawing and those pages will need to be initialed by the instructor before leaving lab. All other documentation needs to be written in permanent ink! Pages cannot be removed from the notebook but can be added permanently such as graphs, pictures, graded items, etc. but **NO** lab handouts! Anything added to the lab notebook needs to include your initials on the addition and on the page that it is attached to in order to ascertain if something is missing or has fallen out of place. Mistakes happen and are expected; however, they still need to be readable, thus mistakes are only to be crossed out with a single line and no correction tape/fluid can be used. Lab notebooks **CANNOT** be rewritten; this is a legal document that shows what occurred in lab, when it occurred, much like a patient chart – it cannot be edited to make it look prettier. Lab notebooks will be checked at the beginning of lab and again at the end of lab.

Service Learning

We will be participating in a Service Learning project to further your understanding of microbiology, health and Hawaiian culture. Scientific studies have shown the importance of the microbiome and health; conditions such as acne, allergies, dental cavities, gastric ulcers and malnutrition have been linked to changes in the microbiome. More recently, diabetes, obesity, autoimmune diseases such as multiple sclerosis, lupus and rheumatoid arthritis have been linked to missing or low levels of protective bacteria in the gut microbiome. A study published in PLoS ONE showed that children with autism had distinct differences in the diversity and genus abundance of their gut microbiome compared to non-autistic children (Kang D-W, Park JG, Ilhan ZE, Wallstrom G, LaBaer J, Adams JB, et al. (2013) Reduced Incidence of *Prevotella* and Other Fermenters in Intestinal Microflora of Autistic Children. PLoS ONE 8(7): e68322. doi:10.1371/journal.pone.0068322). As the gut microbiome is linked to human health, so is the plant microbiome linked to the health of the plant, thus we will be using the plant microbiome as an analogue to the human microbiome and health. Using Native Hawaiian Medicinal plants, we will be testing the soil, roots and leaves of the plants to determine their microbiome as well as inoculating the plants with different agents and testing for changes in the plant microbiome. Just as taking antibiotics to treat pathogenic bacteria also affects the 'good' gut bacteria, so does the action of adding pesticides, herbicides and fertilizers to the plant affect its 'good' microbes. This project will start with planting a selection of Native Hawaiian plants that have been used to treat a variety of illnesses and guest lectures who will discuss their cultural and medicinal importance. The planting/guest lectures will take place on one Saturday (TBA); however, the rest of the plant maintenance will occur on your own; I will provide a basic schedule for which lab group is responsible for which day/week. Acquisition of samples and testing will occur during scheduled lab times. Please remember, the plants being used are linked treating a variety of diseases, but as I am not a medical doctor, I am not making any recommendations as to the treatment of any medical condition; however, I do believe it is important to understand that many people seek alternatives to Western-medicine and the mixing of any medication, be it prescription, over-the-counter or herbal, may result in unwanted interactions with serious health implications. You will be discussing both the scientific results and the cultural/medicinal aspects of this project in the group lab report.

Grading:

Percent Breakdowon:	Grading Scale/Letter Grade:
20% = Lab Notebook	A = 90 - 100%
30% = Service Learning/Lab Report	B = 80 - 89%
10% = Lab Report Drafts	C = 70 - 79%
15% = Lab Quizzes/Practical	D = 60 - 69%
15% = Lab Final/Practical	F = 59% and below
10% = Attendance and Attitude (following safety precautions, participation, etc.)	

Tentative Lab Schedule and Important Dates
(Subject to change; announcements will be made in lecture or online.)

Week	Dates	Description
1	M 8/24	Lab Check-in, Lab Safety, Lab Equipment, Quiz Dry Lab: Chem review, micro and cell biology apps
	W/R 8/26, 27	Lab Check-in, Lab Safety, Lab Equipment, Quiz Dry Lab: Chem review, micro and cell biology apps
2	M 8/31	Lecture - Chapter 2: Culturing and Microscopy of Microorganisms Lab Activity - Using a Microscope Sampling – Survey of the Microbial World Around Us
	W 9/2	***Add-Drop Last Day***
	W/R 9/2, 3	Lecture - Chapter 2: Culturing and Microscopy of Microorganisms Lab Activity - Using a Microscope Sampling – Survey of the Microbial World Around Us
3	M 9/7	**Labor Day – No Class**
	W/R 9/9,10	Survey of the Microbial World/Hand Washing results Bacterial Isolation/Streak Plates – Aseptic Techniques
4	M 9/14	Survey of the Microbial World/Hand Washing results
		Bacterial Isolation/Streak Plates – Aseptic Techniques
	W/R 9/16,17	Slide Fixing/Staining – Gram Stain, Endospore Stain
5	M 9/21	Slide Fixing/Staining – Gram Stain, Endospore Stain
	W/R 23, 24	**Lab Quiz/Practical 1** **Lab Notebook Check**
6	M 9/28	**Lab Quiz/Practical 1** **Lab Notebook Check**
	W/R 9/30, 10/1	Hawaiian Medicinal Plants Microbiome Week 1: *Field - Soil, root, leaf sampling/plating – Exp. 1*
7	M 10/5	Hawaiian Medicinal Plants Microbiome Week 1: *Field - Soil, root, leaf sampling/plating – Exp. 1* *Field – Inoculation w/ Mycorrhizal – for Exp. 2*
	W/R 10/7, 8	**Discoverer's Day – No Class**
8	10/11	**Abstract/Methods & Materials Draft Due – eCollege by**

		Midnight
	M 10/12	**Discoverer's Day – No Class**
Week	**Dates**	**Description**
8 cont.	W,R 10/14, 15	Hawaiian Medicinal Plants Microbiome Week 2: *Field – Soil/root, leaf sampling/plating – sampling of Exp. 2* *Lab - Plate Observation/Slide Fixing/Staining/Microscopic Evaluation – Part 1 results*
9	M 10/19	Hawaiian Medicinal Plants Microbiome Week 2: *Field – Soil/root, leaf sampling/plating – sampling of Exp. 2* *Field – Inoculation w/ organic vs. inorganic fertilizer* *Lab - Plate Observation/Slide Fixing/Staining/Microscopic Evaluation – Part 1 results*
	W,R 10/14, 15	Hawaiian Medicinal Plants Microbiome Week 3: *Field - Soil/root, leaf sampling/plating – sampling of Exp. 3* *Lab - Plate Observation/Slide Fixing/Staining/Microscopic Evaluation cont. – Exp. 2 results*
10	10/17	**Introduction and Updated Abstract/Methods & Materials Draft Due – eCollege by Midnight**
	M 10/19	Hawaiian Medicinal Plants Microbiome Week 3: *Field - Soil/root, leaf sampling/plating – sampling of Exp. 3* *Lab - Plate Observation/Slide Fixing/Staining/Microscopic Evaluation cont. – Exp. 2 results*
	W/R 10/21, 22	Hawaiian Medicinal Plants Microbiome Week 4: *Lab - Plate Observation/Slide Fixing/Staining/Microscopic Evaluation cont. – Exp. 3 Results*
11	M 11/2	Hawaiian Medicinal Plants Microbiome Week 4: *Lab - Plate Observation/Slide Fixing/Staining/Microscopic Evaluation cont. – Exp. 3 Results*
		Lab Quiz
	W/R 11/4, 5	**Lab Notebook Check** Hawaiian Medicinal Plants Microbiome cont: any final microscope evaluation
	F 11/6	***Last Day to Withdraw, Credit/No Credit***
12	11/7	**Results Rough Draft Due – eCollege by Midnight**
	M 11/9	**Lab Quiz** **Lab Notebook Check** Hawaiian Medicinal Plants Microbiome cont: any final microscope evaluation
	W/R 11/11,	**Veteran's Day – No Class**

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Week	Dates	Description
13	11/16, 18, 19	Lab Report - Writing
14	11/25 M/W 11/23, 25	***Service Learning Lab Report Due by Midnight – e College*** TBA
	R 11/26	***NO CLASS: Thanksgiving***
15	11/30, 12/1, 2	**Final Exam/Practical** **Final Lab Notebook Check**

(Subject to change; announcements will be made in lecture or online.)