

## ZOOL 141L – Human Anatomy & Physiology Lab I

CRN 61521 - 03 Credits

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### WINDWARD COMMUNITY COLLEGE MISSION STATEMENT

*'O keia ka wā kūpono e ho'onui ai ka 'ike me ka ho'omaopopo i kō Hawai'i mau ho'oilina waiwai. Aia nō ho'i ma ke Kulanui Kaiāulu o ke Ko'olau nā papahana hou o nā 'ike 'akeakamai a me nā hana no'eau. Me ke kuleana ko'iko'i e ho'ohiki ke Kulanui e kāko'o a e ho'okumu i ala e hiki kē kōkua i ka ho'onui 'ike a nā kānaka maoli. Na mākou nō e ho'olako, kāko'o a paipai i nā Ko'olau a kō O'ahu a'e me nā hana no'eau ākea, ka ho'ona'auao 'oihana a me ka ho'onui 'ike ma ke kaiāulu — hō'a'ano a e ho'oulu i nā haumāna i ka po'okela.*

*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 to accompany ZOOL 141. Reinforces major concepts of human anatomy and physiology through dissections, examination of models, laboratory experiments, and other hands-on activities. This course is intended for students entering health care or other medically related fields such as nursing, physical therapy, and medical technology. (3 hrs. lab) WCC DY

### PREREQUISITES

Credit for or registration in ZOOL 141 or equivalent preparation or consent of instructor.

### STUDENT LEARNING OUTCOMES

*The student learning outcomes are*

- Use the scientific method to design and conduct a clinical research study.
- Describe the anatomy of the integumentary, skeletal, muscular, and nervous systems from prepared slides, models, and real and virtual animal dissections.
- Use basic laboratory and medical equipment to evaluate functions of the above body systems.
- Use critical thinking to analyze and interpret clinical data.
- Prepare an oral presentation and written summary of lab activities using the scientific method.

## COURSE CONTENT

### *Course Content and Topics*

- Scientific Method
- Chemical Reactions
- Homeostasis
- Osmosis and Diffusion
- Cell Anatomy and Cell Division
- Classification of Tissues
- Body Fat
- Skeletal System and Bone Tissue
- Joints
- Muscular System and Muscle Tissue
- Nervous System and Nervous Tissue
- Sensory Systems
- Reflex Physiology

## COURSE TASKS, ASSESSMENT AND GRADING

***LABORATORY SUMMARIES*** The student will complete a total of 12 written laboratory summaries (20 points each) by submitting corresponding laboratory workbook pages or report as defined in the lab activity. Each summary must be completed and turned in no later than the beginning of the first laboratory meeting after the assignment was given (240 points total). The production of laboratory summaries should be considered an individual student task. The sharing of data tables and graphs between students is considered a form of plagiarism and is inappropriate. ***LATE SUMMARIES RECEIVED WITHIN ONE WEEK OF THE DUE DATE WILL BE ASSESSED AN AUTOMATIC PENALTY OF 3 POINTS. SUMMARIES WILL NOT BE ACCEPTED IF SUBMITTED MORE THAN ONE WEEK FOLLOWING THE DUE DATE.***

***PRE-LAB QUIZZES*** The student will take a total of 12 pre-lab quizzes and one lab safety quiz (15 points each) administered via Lulima ***BEFORE*** the scheduled laboratory meetings. These quizzes will test the student's knowledge of and preparation for the laboratory exercise planned for that day, as well as the student's understanding of the previous laboratory activity. In general, these quizzes will be posted on the Lulima site the Tuesday prior to the upcoming lab meeting. Access to the quiz will be prohibited beginning one hour before the lab meeting. Of these 13 quizzes, only the 10 best scores will be included in the student's point total (150 points total). ***NO MAKE-UP QUIZZES FOR ANY ABSENCES (EVEN RESULTING FROM LEGITIMATE ILLNESS) WILL BE ADMINISTERED.***

***LABORATORY PRACTICAL EXAMS*** The student will take two laboratory practical examinations (one midterm exam and one non-cumulative final exam; 100 points each) to demonstrate acquisition of laboratory skills and an understanding of information presented during laboratories.

***ORAL LABORATORY REPORT*** Students will work together in groups of 3-4 individuals to make an oral presentation (15-20 minutes) summarizing the activities of a chosen laboratory session (50 points).

**LABORATORY ATTENDANCE** Regular attendance is expected. Because laboratories involve considerable set-up/take-down time and supervision, students will **NOT** be able to make up missed laboratory activities. A missed laboratory session will cost the student 25 points per session (i.e., the student's overall point total for lab will be reduced by 25 points for each lab session missed). A student missing a scheduled laboratory activity **because of a documented illness or legitimate emergency** may be given an alternative activity, at the instructor's discretion, to make up lost points. In such a circumstance, the student is still responsible for the information presented during the missed laboratory session. Regardless of the reason, **A STUDENT MISSING MORE THAN TWO REGULARLY-SCHEDULED LABORATORY SESSIONS WILL NOT RECEIVE CREDIT FOR THE COURSE.** They should also be aware that missing a laboratory session may negatively impact the student's opportunity and/or ability to complete a laboratory report for a missed session.

**LAB ATTIRE, CONDUCT AND HYGIENE** Because biology labs often involve working with hazardous materials and living organisms, students must dress appropriately. Students must wear closed-toe shoes in the lab (lab coats or aprons are recommended). In addition, some lab activities will require students to wear gloves and safety glasses (provided by the college). Students failing to dress appropriately for lab will not be permitted into the laboratory and will be considered to be absent for the missed lab activity. Students engaged in conduct that threatens the safety of themselves and others in the lab will be refused access to the lab for the remainder of the semester and will receive an "F" for the course. Students are also expected to clean up their workstations following the lab activities. Failing to do so will lead to a 5-10 point penalty depending upon the seriousness of the infraction.

**LABORATORY NOTEBOOK** The student will maintain a laboratory notebook to record all notes, observations, and information gathered before and during laboratory activities. This notebook should be a spiral-bound (or comparable) notebook. **This notebook must be brought to every laboratory period.** This notebook will not be collected for grading. But the maintaining of this notebook by the student will greatly increase the opportunity for success in this class.

**The assignment of points will be according to the following protocol:**

Practical Examinations	200	points
Pre-Lab Quizzes	150	points
Laboratory Summaries	240	points
<u>Oral Lab Report</u>	<u>50</u>	<u>points</u>
<b>TOTAL</b>	<b>640</b>	<b>points</b>

**Letter grades will be assigned as follows:**

<b>A</b>	90% or above in total points.
<b>B</b>	80-89.9% of total points.
<b>C</b>	65-79.9% of total points.
<b>D</b>	55-64.9% of total points.
<b>F</b>	Below 55% of total points or informal or incomplete official withdrawal from course.
<b>I</b>	Incomplete; given at the <b>INSTRUCTOR'S OPTION</b> when student is unable to complete a small part of the course because of circumstances beyond his or her control. It is the <b>STUDENT'S</b> responsibility to make up incomplete work. 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).
<b>CR</b>	65% or above in total points; the student must indicate the intent to take the course as <b>CR/NC</b> in writing by the end of the 10th week of classes (see catalog).
<b>NC</b>	Below 65% of total points; this grade only available under the <b>CR/NC</b> option (see above and see catalog).
<b>N</b>	<b>NOT GIVEN EXCEPT UNDER EXTREMELY RARE CIRCUMSTANCES</b> (e.g., documented serious illness or emergency that prevents the student from officially withdrawing from the course); never used as an alternative for an "F" grade.
<b>W</b>	Official withdrawal from the course after the third week and prior to the end of the 10th week of classes (see catalog).

Waiver of minimum requirements for specific grades may be given only in unique situations at the instructor's discretion.

Students involved in academic dishonesty will receive an "F" grade for the course. Academic dishonesty is defined in WCC's college catalog.

## LEARNING RESOURCES

Required Textbook: Marieb, E.N. & S. Mitchell, 2017. Human Anatomy and Physiology Laboratory Manual. (Custom Edition). Pearson Benjamin Cummings, San Francisco, CA.

Handouts and selected readings from various texts may also be distributed through the class Lualima site.

## TENTATIVE SCHEDULE OF LECTURE TOPICS

Week	Date	Topics	Reading	HW
1	8/21	Lab Introduction Safety Language of Anatomy Organ System overview (no rat dissection or human cadaver)	Syllabus Exercise 1 (p. 7) Exercise 2 (p. 23)	p.17-20; p. 33-34
2	8/28	The Microscope Cell Anatomy and Division (note: no scientific method)	Exercise 3 (p. 37) Exercise 4 (p. 49)	p. 45-48; p. 59-62
3	9/4	<b>Labor Day</b>		
4	9/11	Cell Transport Mechanisms: Osmosis and Diffusion	Exercise 5 (p. 65) On-line handout (print)	p. 75-78;
5	9/18	Classification of Tissues	Exercise 6 (p. 79)	p. 99-104
6	9/25	The Integumentary System Body Size and Composition And membranes <b>(Osmosis Research Paper Due)</b>	Exercise 7 (p. 107)	p. 117-120
7	10/2	Bone Tissue and Axial Skeleton	Exercise 8(p. 123) Exercise 9 (p. 137)	p. 133-136; p. 157-163
8	10/9	Appendicular Skeleton Joints: Articulations and Body Movements	Exercise 10 (p. 165) Exercise 11(p. 187)	p. 179-185; p. 201-204
9	10/16	<b>Lab Practical #1 (up to joint movements)</b>		
10	10/23	Muscle Tissue Gross Anatomy and Classification of Muscles I	Exercise 12 (p. 207) Exercise 13 (p. 217)	p. 213-216; p. 247-254
10	10/30	Gross Anatomy and Classification of Muscles II	Exercise 13 (p. 217)	
12	11/6	Muscle Physiology PhysioEx 9.1 Computer simulation	back of lab manual p. 683	p. 697-700
13	11/13	Histology of Nervous Tissue Gross Anatomy of the Brain & cranial nerves Spinal Cord & Nerves	Exercise 14 (p. 255) Exercise 15 (p. 267) Exercise 16 (p. 293)	p. 263-266 p. 285-290 p. 305-307
14	11/20	Human Reflex Physiology General Senses	Exercise 17 (p. 309) Exercise 18 (p. 323) Print online handout	p. 319-322 p. 329-330
15	11/27	Special Senses: Anatomy of Visual system Visual Tests & Experiments Hearing & Equilibrium Olfaction & Taste	Exercise 19 (p. 333) Exercise 20 (p. 347) Exercise 21 (p. 357) Exercise 22 (p. 375)	p. 341-344 p. 353-355 p. 369-372 p. 381-382
	12/4	<b>Lab Practical #2</b>		

## **STUDENT RESPONSIBILITIES**

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

Students are expected to participate in all laboratory activities and complete all course assignments on time.

Students are expected to be prepared in advance when they arrive to class. Being prepared includes the following: having already read text materials (e.g., textbook readings and handouts) assigned for that day's activities, bringing required work materials (e.g., lab notebook, textbook, handouts, writing supplies, etc.), and having completed any assigned pre-lab tasks.

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

It is the student's responsibility to be informed about deadlines critical to making registration changes (e.g., last day of erase period and last day for making an official withdrawal).

The student should understand that ZOOL 141L is a difficult course for students intending to major in one of the biological sciences. Thus ZOOL 141L requires much time and serious dedication. If the student does not have a strong background or interest in science, the student does not belong in this lab course.

## **HOW TO SUCCEED IN THIS CLASS**

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

Students are expected to participate in all lab activities and complete all course assignments on time.

The student will not succeed in this class without taking careful lab/lecture notes and reading the corresponding material in the textbook. As soon as possible (best if done on the same day), the student should copy over these notes filling in gaps and missing information by referring to the textbook and other resources provided. The student should carefully review these rewritten lab/lecture notes as often as possible.

In addition to copying over lab/lecture notes, study activities should include drawing labeled diagrams or graphs that illustrate important concepts. These diagrams need not be works of art, but should clearly illustrate significant information. Before an exam, it would be useful to redraw these labeled diagrams and graphs from memory.

The student should make flashcards for each new vocabulary word presented (refer to textbook and study guides for lists of required terms). The student should use these card for self-testing as often as possible. The student should also practice using the words to explain concepts learned.

The student should do all of the recommended lab and study guide activities and review all of the Internet resource materials provided.

The textbook and other resources may include useful study questions. The student should write out answers to all of these questions as though they were required assignments. Students could exchange these answers and provide constructive feedback to each other.

The student should read the textbook materials corresponding to a particular lab activity before and after that lab activity.

Students are recommended to establish study groups and study together. The students in these groups may test each other's knowledge and understanding of the information. They may also take turns teaching each other.

The student should ask the instructor to explain the things that the student does not understand.

## **ZOOL 141L LABORATORY ACTIVITIES**

Students enrolled in ZOOL 141L are advised that certain required course activities are inherently dangerous and may require normal physical abilities. Students are therefore required to read about the inherently dangerous activities described below. In addition, students must read and demonstrate knowledge of their responsibilities while engaged in these activities.

Some students may have physical conditions that restrict their participation in certain laboratory activities. Respiratory ailments, certain allergies, and pregnancy may be among these conditions. Students exhibiting any of these conditions, or any other condition that may be impacted adversely by participation in the activity, should consult a physician.

## **INHERENTLY DANGEROUS ACTIVITIES IN THE BIOLOGY LABORATORY**

Students may be exposed to chemicals (e.g., formaldehyde, organic solvents, acids, and other caustic chemicals), chemical fumes, laboratory equipment and supplies (e.g., scalpels, razor blades, glass slides, coverslips, and electrical equipment), toxic or irritating properties of living and dead animals, human organic matter (e.g., saliva and blood), and other materials necessary to laboratory activities of this or other laboratory classes. Other possible hazards include broken glass on the floor or counters, combustible materials (e.g., bunsen burner gas), and slippery spills.

## **RESPONSIBILITIES OF STUDENTS IN THE LABORATORY**

1.	Students should be familiar with safety procedures and take appropriate precautions at all times to insure the safety of every student in the lab.
2.	Students should follow instructions carefully, especially when hazardous conditions occur or hazardous materials are being used.
3.	Students should locate the placement of safety equipment and supplies in the laboratory: safety shower, eye wash station, fire extinguisher, and first aid kit. Students should understand the use of this equipment. Also note the locations of exits.

4.	Anyone injured in the lab, should inform the instructor immediately and take immediate action to reduce the risk of further injury.
5.	Students should familiarize themselves with the fire procedures. Extinguish small fires, but leave the building immediately should a major fire occur. Notify the appropriate authorities -- don't assume someone else remembered to do it. Meet with other students and your instructor outside the building before leaving so that an accurate headcount may be made.
6.	Students should dress appropriately in the lab. Students may elect to supply their own gloves and protective aprons or laboratory coats. Some lab activities may require protective eyewear (provided for the activity by WCC).
7.	Students should report all hazardous conditions to the instructor immediately.
8.	Chemicals may be poisonous, corrosive, or flammable. No chemicals, even chemicals known to be safe, should be ingested, inhaled, or touched unless specifically directed to do so by your instructor.
9.	All organisms, living or dead, should be treated with care and respect. Avoid direct handling when possible.
10.	The safe use of specific equipment and tools (e.g., microscopes, slides, scalpels, and pipettes) will be demonstrated by the instructor during the laboratory sessions. Students should be sure they understand this usage.
11.	Students should clean up any supplies used and should return materials where they belong as instructed. Any material spilled should be cleaned appropriately. Report and hazardous spills or breakages.
12.	Broken glass and sharp metal waste should be placed only in those receptacles marked for such disposal -- do not put these materials in normal trash receptacles.
13.	Some chemical wastes may not be dumped into laboratory sinks. In such circumstances an appropriate container will be provided for this waste in the lab.
14.	Organic waste resulting from animal dissection activities should be disposed of in the appropriate receptacle, not the ordinary trash receptacles.
15.	Human organic materials (e.g., saliva and blood) must be disposed of in such a way as to eliminate any possibility for contamination and the spread of disease. Appropriate handling and disposal procedures will be explained when human materials are involved in the laboratory exercise.
16.	Clean up the laboratory area: remove and dispose of all trash; return supplies and equipment to appropriate locations; and disinfect bench area.



17.	After completing laboratory activities and clean up, students should wash their hands in the restroom to avoid spreading contamination and hazardous chemicals.
18.	The laboratory is a place for learning. Therefore, eating, drinking, and playing around is prohibited during the laboratory session. Students exhibiting unsafe or inappropriate behavior in the lab may be asked to leave and may be given an "F" grade for the course.

## **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](mailto:lemke@hawaii.edu), or you may stop by Hale 'Akoakoa 213 for more information.