ZOOLOGY 142L  ANATOMY AND PHYSIOLOGY LABORATORY
1 Credit - CRN 63064 – TR, 10:30 am – 1:40 pm in 103 Imiloa

INSTRUCTOR: Allison Beale
OFFICE: 118 Imiloa
OFFICE HOURS: TBA see office door after the semester stats
TELEPHONE: use email  EMAIL: abeale@hawaii.edu
EFFECTIVE DATE: Summer 2018

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 to accompany ZOOL 142. Reinforces the facts and concepts of human anatomy and physiology discussed in ZOOL 142 through dissections, examination of models, laboratory activities, and other hands-on experiences. This course is intended for students entering health care or medically-related fields such as nursing, physical therapy and medical technology.

Prerequisite: Credit for or registration in ZOOL 142 or equivalent preparation or consent of instructor.

DY.

Activities Required at Scheduled Times Other Than Class Times

No REQUIRED scheduled activities outside of lab. There may be OPTIONAL activities.

STUDENT LEARNING OUTCOMES

The student learning outcomes for the course are as follows:

1. Use the scientific method to design and conduct a clinical research study.
2. Describe the anatomy of the endocrine, circulatory, lymphatic, respiratory, digestive, urinary, and reproductive systems from prepared slides, models, and real and virtual animal dissections.
3. Use basic laboratory and medical equipment (microscopes, sphygmomanometers, stethoscopes, ECG apparatus, and respiratory spirometers) to evaluate functions of the above body systems.
4. Use critical thinking to analyze and interpret clinical data.
5. Prepare an oral presentation and written summary of lab activities using the scientific method.
COURSE CONTENT

Concepts or Topics (the terms, topics, or concepts students should know or understand)

- Scientific method
- Chemistry including biochemistry related to osmosis, diffusion, metabolism and respiration.
- Homeostasis
- Anatomical terms
- Cell anatomy and physiology
- Organ system anatomy and physiology
  - Fat (adipose tissue)
  - Skeletal (bone, cartilage and joints)
  - Muscle, including origins and insertions of major muscles.
  - Nervous system including sensory and motor aspects
  - Cardiovascular system
  - Respiratory system
  - Digestive system
  - Endocrine
  - Blood and Lymphatic systems
  - Urogenital and reproductive systems
- Tissue anatomy and physiology
  - Connective
  - Epithelial
  - Muscular
  - Nervous

Skills or Competencies (what students should be able to do in order to complete the student learning outcomes)

1. Identify the gross and microscopic anatomy of major organ systems;
2. Explain the physiology of major cell types;
3. Explain the physiology of major tissues;
4. Explain the physiology of major organs.
5. Identify the major cellular components of major tissues and organs.
6. Use the “tools of the trade” appropriately, including microscopes, dissection tools, microscope slides, blood pressure cuffs, ECG recording devices, tissue stains, spirometers, blood oximeters and other lab equipment.
7. Interpret visual, hands-on materials, including slides, models and virtual dissections into an oral and written presentation and lab notebook.
8. Interpret visual, hands-on materials and data into clinical profiles.
9. Present findings orally to the class and in writing to the instructor.

COURSE TASKS

1. Attend class at scheduled times, without arriving late or leaving early without prior consent of instructor.
2. Participate in all lab activities, including:
   a. Making yourself familiar with all lab safety procedures
   b. Taking appropriate precautions at all times to ensure your own safety and the safety of others and the environment
      i. Know the locations of important safety equipment and the fundamentals of their use including:
         1. Eyewash stations
         2. Safety shower(s)
         3. Fire extinguisher
         4. First Aid kit
         5. Who to summon in the event of an accident or emergency
   c. Follow instructions
d. **Dress appropriately for lab**
   i. **Closed toed shoes are REQUIRED**
   ii. Safety glasses and gloves are REQUIRED for any lab using chemicals, hot-plates or which may expose you or others to body fluids.
   iii. **Lab coat or other appropriate covering is REQUIRED**

e. **Report any chemical spills, broken glassware or other hazardous situations immediately to the instructor**
   i. Place all broken glass, sharps and dissected specimens in the appropriate receptacles (usually red plastic sharps boxes), NOT IN THE TRASH.
   ii. All tissues and body fluids, human or otherwise, including saliva, blood, or other tissues, must be disposed of in the appropriate red plastic bio-hazard container, NOT IN THE TRASH.

f. **Chemicals used in lab may be poisonous, corrosive or flammable.**
   i. Do not ingest any chemical, even those known to be safe, in the lab.
   ii. Do not touch any chemical in the lab without wearing gloves unless specifically instructed by your instructor to do so.
   iii. Unless otherwise instructed, chemical wastes should NOT GO DOWN THE DRAIN.
   iv. **DO NOT CONSUME FOOD OR BEVERAGES IN LAB.**
   v. Again: **NO FOOD OR BEVERAGES ALLOWED IN THE LAB!**

g. **Know how to safely use and operate all lab equipment and tools, including:**
   i. Microscopes
   ii. Glass microscope slides
   iii. Hematology supplies
   iv. Scalpels and other dissection tools

h. **Treat all organisms, living or dead, with care and respect.**
   i. Always handle dissection specimens with gloves.
   ii. Wash your hands, even if you have been wearing gloves, after handling dissection specimens.
   iii. Use dissection trays. Never put dissection materials or equipment directly on the lab bench.
   iv. **Clean all lab supplies and return them** to their proper location before leaving lab.

j. Clean your bench top before leaving by using the cleaning solutions available at the back of the lab and wiping down the counter with paper towels.

k. **WASH YOUR HANDS** immediately following lab to reduce the possibility of infection or contamination.

3. **Record results of lab activities in a lab notebook.**
   a. Number, prior to the start of class, all the pages of your lab notebook using a pen (not a pencil) if you are using a bound composition-style notebook.
   b. You may keep your notes on a computer, but make sure to personally label all figures, drawings, and photos.

4. Complete weekly in class quiz, if given.
5. Complete 2 in-class practical exams.
6. Present (orally and in writing) results of lab activities.

**ASSESSMENT TASKS AND GRADING**

**Practical Exams** – 2 in-class practical exams. 100 points each, for **200 points**.
Practical exams cover:
1. Anatomy (gross and cellular) and physiology (function) of major systems covered
in lab.
2. Practical exams are not comprehensive; they cover blocks of labs.
3. Practical exams may be online and taken in lab.

Quizzes – One per lab session, 10 points per quiz. Planned: 10 quizzes for 100 points. During the summer, some lab sessions will have two quizzes.

- Taken online, at the start of the lab and covering anatomy and physiology of the lab(s) to be done that day.
  - Based on extra credit for each lab and are taken from the review sheets in the lab manual.
  - May be simple identification, as in matching the name to a structure, or require correct spelling of the name of a structure. Questions may be multiple-choice.

Lab Notebook – 5 reports for a total of 250 points.
1. The following labs will be assessed:
   a. Endocrine
   b. Blood, blood types, hematocrit
   c. Lungs and respiratory anatomy and physiology
   d. Gastrointestinal anatomy and physiology
   e. Renal anatomy and physiology

Lab Reports – one written lab report, worth 50 points:
1. Cardiovascular physiology (Lab Exercise 33 with Supplemental activities)
2. If CV report score was less than 30 points, the student will be required to schedule a conference with the instructor during office hours to discuss how to improve the paper, rewrite the paper and submit it for reassessment. Due dates to be announced.

Oral Report(s) –
- 100 points each person
- Each lab session starting the second week, a lab group will be tasked with presenting the findings and analysis from the previous week’s lab.
  - One partner covers clinical relevance and applications (5 minutes)
  - One partner covers data collected and analysis (5 minutes)

Participation and attendance – Attendance is mandatory.

- Any unexcused absence, which includes late arrivals or early departures, will require the student to schedule an appointment with the instructor within one week of the absence to discuss how the student is going to ensure they meet the requirements for passing the lab.
  - Excused absences include a medical emergency for yourself or an immediate family member. Excused absences must be confirmed with a written, signed and dated waiver on official stationary (e.g., a doctor’s work release note).

- Make up labs are not an option, so two unexcused absences will result in a failing grade (an “F”).
- Some labs involve non-invasive clinical measurements (such as skin-fold measurements or reflex testing). If you have a health condition or other reason why you should not be required to participate in these activities, you must notify the instructor. Experiments involving invasive or semi-invasive procedures will be performed on volunteers only. Such procedures may include finger sticks and urinalysis. Otherwise, all students are expected to fully participate and to share in the roles of subject and administrator.

Optional lab
- Cadaver lab at the UH John A. Burns School of Medicine (JABSOM)
- Scheduled for an evening and it replaces one normal lab session
- Cost: nonrefundable $25.00 to cover JABSOM administration and personnel
- Details to be announced in class
NOTE: All assignments are due ON or BEFORE the due date (at the **START** of lab on the due date). The following are NOT ACCEPTED:

1. Late assignments, including work submitted AFTER THE START OF LAB.
2. eMailed work
3. Materials left in my office or mailbox.

**Extra Credit** –

- **5 points per lab**
- Involves completion of **ALL** the review questions at the end of each lab manual exercise performed in class.
  
  o **No partial credit**, all the questions for any lab exercise performed must be completed
  
  - Must be **100% complete**, anything missing will result in no credit.
  
  o Due at the start of the following (subsequent) lab.
  
  o No late work

Total points for the course: approximately 650.

Total optional, EC: approximately 50 points. Doing the EC can raise your grade a full grade!!

Grade is a straight percentage of the total points.

**SUMMARY OF ASSESSMENT AND EXTRA CREDIT AWARD STRUCTURE**

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Number</th>
<th>Type</th>
<th>Points each</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes</td>
<td>Up to 10</td>
<td>Matching, fill-in-the-blank, multiple-choice</td>
<td>10</td>
<td>100</td>
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<tr>
<td>Lab practical</td>
<td>Two</td>
<td>Multiple-choice</td>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td>Notebook</td>
<td>Five</td>
<td>Written</td>
<td>50</td>
<td>250</td>
</tr>
<tr>
<td>Paper</td>
<td>One</td>
<td>Written</td>
<td>50</td>
<td>50</td>
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<tr>
<td>Oral report</td>
<td>One</td>
<td>Oral</td>
<td>100</td>
<td>100</td>
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<tr>
<td><strong>TOTAL AVAILABLE POINTS</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>700</strong></td>
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<tr>
<td>Extra credit</td>
<td>Up to 10</td>
<td>Matching, fill-in-the-blank, multiple-choice</td>
<td>5</td>
<td>45-50</td>
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<table>
<thead>
<tr>
<th>POINTS</th>
<th>PERCENTAGE (%)</th>
<th>GRADE</th>
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<tbody>
<tr>
<td>630-700</td>
<td>90-100</td>
<td>A</td>
</tr>
<tr>
<td>560-629</td>
<td>80-89</td>
<td>B</td>
</tr>
<tr>
<td>490-559</td>
<td>70-79</td>
<td>C</td>
</tr>
<tr>
<td>420-489</td>
<td>60-69</td>
<td>D</td>
</tr>
<tr>
<td>350-419</td>
<td>50-59</td>
<td>F</td>
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</table>

**LEARNING RESOURCES**


Laulima:  [https://laulima.hawaii.edu/portal](https://laulima.hawaii.edu/portal). Students need a UH email account and access to a computer (available in Imiloa and the WCC Library Learning Commons). Laulima hosts a webpage for our course where you will find additional resources including, guidance and instructions, updates, announcements, links to lab activities and the Extra Credit materials.
LAB ATTIRE, CONDUCT AND HYGIENE

1. Biology labs often involve the use of chemicals, including potentially hazardous materials, and potentially dangerous equipment, including sharps such as scalpels and glassware.
   a. Therefore students MUST wear:
      i. **Closed toe shoes**
      ii. And may be required to wear safety glasses and/or protective gloves or other protective equipment.
      iii. **Lab coat**
   b. Therefore students MUST adhere to a strict code of conduct.
      i. Any student engaging in conduct that threatens the safety of themselves or others in lab will be expelled from class and receive an “F” grade for the course.

2. Some lab activities involve body measurements (such as body fat determination through skin fold analysis), light exercise, or the placement of electrodes or sensors on the body. Therefore, students should wear:
   a. Loose-fitting clothing that allows for a free range of movement
   b. Students failing to wear appropriate clothing will not be allowed to participate in lab exercises and will be considered absent for the day.

3. Some lab activities involve contact with chemicals as described in #1 above, other students, as described in #2 above, or with biological fluids during dissections. Therefore, students should:
   a. Maintain a clean lab bench, free of excess personal belongings;
   b. Promptly clean up any spills;
   c. NEVER bring food or beverages into the lab;
   d. ALWAYS WASH YOUR HANDS at the end of lab.

**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.

Revised November 2014
SPRING schedule subject to change. See posted schedule online & watch for announcements in Laulima.

<table>
<thead>
<tr>
<th>Week</th>
<th>Date 2018</th>
<th>Topics</th>
<th>Reading</th>
<th>EC – 5 points each</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td>Introduction, syllabus, safety</td>
<td>Syllabus</td>
<td>None</td>
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<tr>
<td></td>
<td></td>
<td>Endocrine 1</td>
<td>Exercise 27</td>
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<td>2.</td>
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<td><strong>HOLIDAY:</strong></td>
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<td>3.</td>
<td></td>
<td>Blood, blood type, hematocrit</td>
<td>Exercise 29</td>
<td>Endo</td>
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<tr>
<td></td>
<td></td>
<td>• Presentation on Endocrinology</td>
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<td>4.</td>
<td></td>
<td>Anatomy of the heart and blood vessels</td>
<td>Exercises 30 &amp; 32</td>
<td>Blood</td>
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<td>• Presentation on blood, blood tests</td>
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<td>5.</td>
<td></td>
<td>Lymphatics and immunity</td>
<td>Exercise 35</td>
<td>Heart and blood</td>
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<td>• Presentation on CV anatomy</td>
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<td>vessels</td>
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<td>6.</td>
<td></td>
<td>CV Physiology, EKG, Blood Pressure and Pulse</td>
<td>Exercise 33</td>
<td>Lymphatics</td>
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<td>• Presentation on Immunity</td>
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<td>7.</td>
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<td><strong>HOLIDAY:</strong></td>
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<td>8.</td>
<td></td>
<td>Lung Anatomy &amp; Physiology</td>
<td>Exercises 36 &amp; 37</td>
<td>CV physiology</td>
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<td></td>
<td>Cardiovascular report due</td>
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<td></td>
<td>• Presentation on CV physiology</td>
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<td>9.</td>
<td></td>
<td>Lab practical #1 – Endocrine, Lymphatics, Immunity, all CV and Lungs.</td>
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<td>Notebooks due</td>
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<td>10.</td>
<td></td>
<td>GIT anatomy and physiology</td>
<td>Exercise 38</td>
<td>Lung A&amp;P</td>
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<td>Optional CV report rewrite (only if score on CV report was less than 60%, score replaces 1st CV score)</td>
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<td>• Presentation on lung A&amp;P</td>
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<td>11.</td>
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<td>Surface Anatomy</td>
<td>Exercise 46</td>
<td>GIT anatomy</td>
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<td>• Presentation on GIT A&amp;P</td>
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<td>13.</td>
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<td>Kidney Anatomy and Physiology</td>
<td>Exercise 40</td>
<td>Surface Anatomy</td>
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<td>• Presentation on surface anatomy</td>
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<td>14.</td>
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<td>Cadaver Lab at JABSCOM – Date and time TBA</td>
<td>Exercise 42-44</td>
<td>Kidney anatomy</td>
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<tr>
<td>15.</td>
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<td>Male and female reproduction, embryology and development</td>
<td>Exercise 45</td>
<td>Male and Female Repro, Development, Heredity</td>
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<td>• Presentation on Kidney A&amp;P</td>
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<tr>
<td>16.</td>
<td></td>
<td>Heredity</td>
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<td></td>
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<td>• Presentation on reproduction and development</td>
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<td>17.</td>
<td></td>
<td>Lab practical #2 – Final, GIT, Surface Anatomy, Kidneys, Reproduction,</td>
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<td></td>
<td></td>
<td>Embryology and Development, Heredity</td>
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</tbody>
</table>
### SUMMER Schedule subject to change.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>LAB Exercise</th>
<th>EC points</th>
</tr>
</thead>
</table>
| 1    | Introduction (syllabus); How to keep a scientific notebook and how to write a scientific report.  
Lymphatics and immunity  
**DUE:** IMMUNE MIND MAP | 35 | None |
|      | **4th of July HOLIDAY** | | |
| 2    | Endocrine and Stress Experiment  
**Presentation on Lymphatics and Immunity**  
**QUIZ:** Endocrinology | 27 | 5 EC – Lymph & Immunity |
|      | Blood, Hematocrit and Blood typing Experiment  
**Presentation on Endocrinology**  
**DUE:** Endocrine experimental write up*  
**QUIZ:** Blood, hematocrit and blood typing | 29 | 5 EC - Endo |
| 3    | Anatomy of the heart and blood vessels; CV Physiology, Blood Pressure and Pulse  
**Presentation on Immunity**  
**DUE:** Blood, hematocrit etc write up*  
**QUIZ:** Anatomy of heart, blood vessels and CV physiology | 30, 32-33 | 5 EC – All Blood  
5 EC – All CV |
|      | **Lab practical #1 – Covers Endocrinology through All Cardiovascular** | | |
| 4    | Lung anatomy and physiology  
**Presentation on CV anatomy & physiology**  
**DUE:** CV paper*  
**QUIZ:** Lung A&P | 36 & 37 | 5 EC – All lung |
|      | Anatomy of GIT  
**Presentation on lung A&P**  
**DUE:** Lung A&P write up*  
**QUIZ:** GIT A&P | 38 &39 | 5 EC – All GIT |
| 5    | Kidney Anatomy  
**Presentation on GIT A&P**  
**DUE:** GIT write up*  
**QUIZ:** Kidney A&P | 40 | 5 EC – All kidney |
|      | Surface Anatomy  
**Presentation on Kidney A&P**  
**DUE:** Kidney write up*  
**QUIZ:** Surface Anatomy | 46 | None |
| 6    | Reproduction, embryology and development; Heredity  
**Presentation on surface anatomy**  
**DUE:** Surface anatomy write up  
**QUIZ:** Repro, embryology, development and heredity | 42-45 | 5 EC – All repro & heredity |
|      | **Lab practical #2 – final** | | |

**TOTAL POINTS**

| See below | 45 |

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1. Each team picks one topic; each team member may acquire up to 100 points. Sign up sheet will be available on the 1st day of class; topics are first come, first serve.
2. Each Quiz is worth 10 points

3. Lab practicals are worth 100 points.
4. CV paper is worth 50 points. If less than 30 points obtained, a rewrite is required and due in one week.