

[Send To Printer](#) | [Close Window](#)**PHYL 141L Lab Syllabus****PHYL 141L Syllabus**

Instructor: Michelle Smith

Office: Imiloa 112B

Office Hours Online: by appointment at <https://meet.google.com/efn-pvsy-exj>Email: [miliefsk@hawaii.edu](mailto:miliefsk@hawaii.edu)**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 PHYL 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)

**Activities Required** Pre-Requisite(s): Credit for or registration in PHYL 141 or equivalent preparation or consent of instructor.

**STUDENT LEARNING OUTCOMES**

Upon successful completion of PHYL 141L, the student should be able to:

- 1) Use the scientific method to design and conduct a clinical research study.
- 2) Describe the anatomy of the integumentary, skeletal, muscular, and nervous systems from prepared slides, models, and real and virtual animal dissections.
- 3) Use basic laboratory and medical equipment 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.

**OFFICE HOURS**

This class has 1 office hour. The meeting can be by phone upon request; however, the preference is for an online live meeting using Google Meet: [meet.google.com/efn-pvsy-exj](https://meet.google.com/efn-pvsy-exj). For lab, office hours occur immediately after class, but are available upon request. I will return all emails in regards to office hours within 24 hours. Also, weekends and holidays will have a slower response.

**LEARNING RESOURCES**

**Lab Manual:**

- WCC's A&P PHYL 141 Lab Manual (free online, printed at bookstore ~\$15)
- WCC's Histology Lab Manual (free online, printed at bookstore ~\$15)
- **Textbook:** Anatomy and Physiology Openstax (hard copy (\$50) or free online OK)

**Purchase:**

- **PhysioEx 10.0;** cost is \$47.99
- PhysioEx 10.0: Laboratory Simulations in Physiology Plus Website Access Code Card for PhysioEx 10.0 -- Access Card Package (includes paperback)  
ISBN-13: 9780136643746  
PhysioEx 10
- **Supply list (ON-LINE ONLY):** go to Lailima- Syllabus- Supply list, for a list of inexpensive supplies. This is only for online lab students. Most items can be purchased on Amazon.

\*In Lab Only: In addition, many students find it helpful to bring a digital camera and USB flash drive to class in order to photograph anatomical specimens and exchange data files and pictures from the digital microscopes.

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**COURSE CONTENT*****Concepts or Topics***

The student will describe and integrate basic biological principles and define basic biological terms presented in lecture, required texts, and other instructional materials. These principles include the following areas:

- ☐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

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**COURSE TASKS**

- 1) Attend class at scheduled times.
- 2) Participate in lab activities.
- 3) Complete required exercises in lab manual.
- 4) Complete 2 Practicals.
- 5) Present results of lab activities.

6) Write a lab report

## **GRADING**

### **Grading:**

Laboratory practical exam	2x 250 500 points
Pre-Lab Quizzes (13)	100 points
Lab Manual/PhysioEx exercises	200 points
Lab Notebook	100 points
<u>Attendance</u>	<u>100 points</u>
<b>TOTAL</b>	<b>1000 points</b>

**LABORATORY PRACTICAL EXAM** (500 points). Two laboratory practical exams will be given during the semester. Each is worth 250 points each toward your lab grade.

The exam questions may consist of multiple choice, fill in the blank or a word bank, and pertain to: 1) any of the structures in the lab manual, or noted on handouts (referring to anatomical models and dissections); 2) the information related to physiology experiments performed; 3) any of the structures and functions on the assigned Slides.

Typically, exams cannot be made up; however, under unusual circumstances (emergencies) I may be able to fit a student in another lab time.

DO NOTE THAT THE LAST LAB PRACTICAL WILL BE HELD DURING THE LAST WEEK OF CLASSES, NOT FINALS WEEK.

**PRELAB QUIZZES** (100 points total). A prelab quiz will be taken on Lualaba prior to each lab related to that day's material. There is a Prelab Quiz information list in Lualaba-Syllabus-Quizzes. Please review it before taking the quiz. You need to have computer access. You will have 72 hours prior to lab to take the quiz and have 10 minutes to complete it. There is no scheduled prelab quiz when a lab practical is scheduled.

**LAB MANUAL and PHYSIOEX EXERCISES** (200 points): Complete all lab manual exercises related to that week's activity to be checked off by the instructor and emailed. Do the same for PhysioEx 10.0 activities. Lab exercises need to be fully complete for full credit and turned in on time for a total of 200 points. Homework is typically due the following week, unless there is a holiday.

**LAB NOTEBOOK** (100 Points): Students are required to maintaining a lab notebook. A lab notebook is a separate composition book used to document experiments, draw microscopic images, and to keep track of valuable lab information. It will be checked at the at the last lab practical. For online, students will need to drop it off at Imiloa 103. There will be a box outside that you place your lab notebook in. Please be sure to have your name and class information. For those who cannot submit it in person other arrangements will be made.

**ATTENDANCE** (100 points): Attendance is mandatory. Each unexcused absence will result in a deduction of 10 points.

### **Final Grade:**

Tentative grades associated with semester exam scores are **only** to give a rough estimate of relative class standing, and are not used to determine the final grade

The standard grade scale will be used to determine your final grade. ( $\geq 90\%$ =A,  $80\%$ - $89\%$ =B,  $70\%$ - $79\%$ =C,  $60\%$ - $69\%$ =D,  $\leq 59\%$ =F)

## **ADDITIONAL INFORMATION**

### **LAB ATTIRE, CONDUCT, AND HYGEINE (In-person lab only)**

Because biology labs often involve working with chemicals or hazardous materials, students **MUST** wear close-toed shoes. In addition, some lab activities will require students to wear gloves and safety glasses (provided by the college). Several labs will involve body measurements (e.g., body fat), light exercise, or the placement of electrodes or sensors on the body. Students should therefore wear loose-fitting clothing that allows for a free range of movement (i.e. no tight-fitting pants or jeans). Students failing to dress appropriately for lab will not be permitted to participate in laboratory exercises and will be considered absent. Students engaged in conduct that threatens themselves or others in the lab will be refused access to the lab for the remainder of the semester and receive an "F" grade for the course.

### **LAB SUBJECT POLICY**

Most labs involve non-invasive clinical measurements (e.g., skin-fold measurement, reflex tests, etc). ALL students are required to participate in these activities. If you have a health condition or other reason why you should not participate you should inform the instructor. Experiments involving invasive or semi-invasive procedures (e.g., finger sticks and urinalysis) will be performed on volunteers only.

**DISABILITIES ACCOMMODATIONS**

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 Accessibility Counselor to discuss reasonable accommodations that will help you succeed in this class. Roy Inouye can be reached at (808) 235-7448, [royinouye@hawaii.edu](mailto:royinouye@hawaii.edu), or you may stop by Hale Kāko'o 106 for more information.

**SEX DISCRIMINATION AND GENDER-BASED VIOLENCE RESOURCES (TITLE IX)**

Windward Community College is committed to providing a learning, working, and living environment that promotes personal integrity, civility, and mutual respect and is free of all forms of sex discrimination and gender-based violence, including sexual assault, sexual harassment, gender-based harassment, domestic violence, dating violence, and stalking.

If you or someone you know is experiencing any of these, WCC has staff and resources to support and assist you. To report an incident of sex discrimination or gender-based violence, as well as receive information and support, please contact one of the following:

**UH CONFIDENTIAL ADVOCATE**

UH Confidential Advocate

Phone: (808) 348-0663

Email: [advocate@hawaii.edu](mailto:advocate@hawaii.edu)

**TITLE IX COORDINATOR**

Karen Cho, Title IX Coordinator

Email: [kcho@hawaii.edu](mailto:kcho@hawaii.edu)

Phone: 808-235-7404

<https://windward.hawaii.edu/about-wcc/title-ix/>

Office: Hale Kāko'o 120B

As a member of the University faculty, I am required to immediately report any incident of sex discrimination or gender-based violence to the campus Title IX Coordinator. Although the Title IX Coordinator and I cannot guarantee confidentiality, you will still have options about how your case will be handled. My goal is to make sure you are aware of the range of options available to you and have access to the resources and support you need.

For more information regarding sex discrimination and gender-based violence, the University's Title IX resources and the University's Policy, Interim EP 1.204, go to [manoa.hawaii.edu/titleix/](https://manoa.hawaii.edu/titleix/)

**ACADEMIC INTEGRITY**

Work submitted by a student must be the student's own work. The work of others should be explicitly marked, such as through use of quotes or summarizing with reference to the original author.

In this class, students who commit academic dishonesty, cheating or plagiarism will have the following consequence(s):

Students will receive a failing grade for plagiarized assignments.

All cases of academic dishonesty are referred to the Vice Chancellor for Student Affairs.

**ALTERNATE CONTACT INFORMATION**

If you are unable to contact the instructor, have questions that your instructor cannot answer, or for any other issues, please contact the Academic Affairs Office:

- Location: Alaka'i 121
- Phone: (808) 235-7422

**TWO-WAY COMMUNICATION DEVICES:**

These devices are not allowed in the classroom. Please see to it that these devices are turned off while in class.

**UH POLICY ON EMAIL COMMUNICATION:**

The electronic communications policy adopted in December 2005 establishes the University of Hawai'i Internet service as an official medium for communication among students, faculty, and staff. Every member of the system has a hawaii.edu address, and the associated username and password provide access to essential Web announcements and email. You are hereby informed of the need to regularly log in to UH email and Web services for announcements and personal mail. Failing to do so will mean missing critical information from academic and program advisors, instructors, registration and business office staff, classmates, student organizations, and others.

**ACADEMIC GRIEVANCE STATEMENT:**

In instructional activities, the students are responsible for meeting all of the instructor's attendance and assignment requirements. Failure to do so may affect their final grade. In all college-related activities, including instruction, they must abide by the college's conduct codes and regulations, refraining from behavior that interferes with the rights and safety of others in the learning environment. Finally, if they decide to file a grievance, they are fully responsible for providing proof that they have been wronged.

**CLASS CANCELLATION:**

Lecture is cancelled if, without prior notice, the instructor is more than 15 minutes late for 75 minute classes or 10 minutes for 50 minute classes.

*This Syllabus is subject to change, when appropriate.*

**LAB SAFETY RULES (in-person lab only)**

1. Be familiar with lab safety procedures and take appropriate precautions at all times to insure the safety of all lab students.
2. Follow all instructions carefully, especially when hazardous materials are being used.
3. Know the locations of important safety equipment: eyewash, safety shower, fire extinguisher, and first aid kit.
4. Report all injuries to the instructor immediately.
5. Dress appropriately for lab. Closed-toe shoes are required for ALL labs. Safety glasses and gloves are required for labs utilizing chemicals, bodily fluids, or hot-plates.
6. Report any hazardous conditions (e.g. chemical spills or broken glass) to the instructor immediately.
7. **NO FOOD ALLOWED IN LAB**
8. Chemicals used in lab may be poisonous, corrosive, or flammable. No chemicals, even those known to be safe, should be ingested or touched with un-gloved hands unless you are specifically directed to do so by your instructor.
9. Know how to safely operate all lab equipment and tools (e.g., microscopes, scalpels, and hematology supplies). Safe usage will be demonstrated by your instructor.
10. Clean all lab supplies and return them to their proper location before leaving lab.
11. Treat all organisms, living or dead, with care and respect. Use gloves when handling dissected specimens.
12. Place broken glass, sharps, and dissected specimens in the appropriate receptacles (**NOT IN THE TRASH!**)
13. Unless otherwise instructed, chemical wastes should **NOT** be disposed of down the drain.
14. Human tissues and bodily fluids (e.g., saliva and blood) must be disposed of in appropriate bio-hazard containers (**NOT IN THE TRASH!**).
15. Wash your hands immediately following each lab to reduce the possibility of contamination or infection.

**PHYL 141 Lab Schedule****PHYL 141L Fall 2023 Sec 61096,**

Tuesday 8:30 am-11:15 Imiloa 103

8/21-12/15/2023

Office Hours by GOOGLE MEET: <https://meet.google.com/efn-pvsv-exj>

WEEK	Date	Topics	Lab Manual Exercises	Histology Manual
1	8/22	Lab Introduction, Safety	Safety pg 5-7	
2	8/29	Scientific Method Language of Anatomy Organ System overview (Q1 scientific method, anatomy, organ system)	Exercise 01 Exercise 02 Exercise 03	

3	9/5	The Microscope Cell Anatomy and Division (Q2 cell, microscope, mitosis)	Exercise 04 Exercise 05	Section 01, 02
4	9/12	Cell Transport Mechanisms: Osmosis and Diffusion (Q3)	Exercise 06	Section 03
5	9/19	Classification of Tissues (Q4)	Exercise 07	Section 04
6	9/26	The Integumentary System Body Size and Composition and membranes (Q5)	Exercise 08	
7	10/3	Bone Tissue and Axial Skeleton (Q6)	Exercise 09 Exercise 10	Section 05
8	10/10	Appendicular Skeleton Joints: Articulations and Body Movements (Q7)	Exercise 11 Exercise 12	
9	10/17	<b>Lab Practical #1 (science method to joint movements) 8:30</b>	extra credit (1 <sup>o</sup> lit review) due	
10	10/24	Muscle Tissue Gross Anatomy and Classification of Muscles (Q8 & Q9)	Exercise 13 Exercise 14	Section 06
11	10/31	Muscle Physiology (Q10)	Exercise 15 PhysioEx 10.0 Ex 2	
12	11/7	Histology of Nervous Tissue Gross Anatomy of the Brain & cranial nerves Spinal Cord & Nerves (Q11)	Exercise 16 Exercise 17 Exercise 18 Brain Dissection	Section 07
13	11/14	Human Reflex Physiology General Senses (Q12)	Exercise 19	
14	11/21	Special Senses: Anatomy of Visual system Visual Tests & Experiments Hearing & Equilibrium Olfaction & Taste (Q13)	Exercise 20 Exercise 21 Exercise 22 Exercise 23 Eye dissection	Section 08
15	11/28	<b>Lab Practical #2 8:30 am</b> (muscle to sensory)	Lab notebook & extra credit (1 <sup>o</sup> lit review) due	

### PHYL 141L Quiz Schedule

## Prelab Quiz Schedule

Quizzes are located under **Test & Quizzes**. Be sure to review the **Prelab Quiz List** (click the link, but also located under **Resources**) before taking the quiz. It opens about 72 hours before and closes before lab starts. You have 10 minutes to take the quiz.

## Tuesday 8:30 am Quiz Schedule 61096

QUIZ	TOPIC	DATES
1	Scientific Method, Anatomy, organ system	8/26 12 am - 8/29 8:30 pm
2	Cell, microscope, mitosis	9/2 12 am – 9/5 8:30 am
3	Diffusion, osmosis	9/9 12 am – 9/12 8:30 am
4	Tissues	9/16 12 am – 9/19 8:30 am
5	Integumentary	9/23 12 am – 9/26 8:30 am
6	Bones and axial skeleton	9/30 12 am – 10/3 8:30 am
7	Appendicular skeleton and joints	10/7 12 am – 10/10 8:30 am
8	Muscles 1	10/21 12 am – 10/24 8:30 am
9	Muscles 2	10/21 12 am – 10/24 8:30 am
10	Muscle physiology	10/28 12 am – 10/31 8:30 am
11	Nervous system	11/4 12 am – 11/7 8:30 am
12	Reflexes	11/11 12 am – 11/14 8:30 am
13	Sensory	11/18 12 am – 11/21 8:30 am

### PHYL 141L Lab Practical Schedule

Lab practicals are posted on **Laulima (tests and quizzes)**. You will be provided with the password on the day of the exam. I will be online (google meet) 15 minutes before the start of the practical.

1. You are required to sign the **honor pledge**;
2. There are 50 multiple-choice questions. It is timed for 1 hour.
3. You are permitted to use a 2 sided, 3x5 inch handwritten note card.
4. Submit your **extra credit** by the end of the day. Extra credit is a review of a primary literature article related to any A&P topic. Write a 1-page minimum, double spaced, typed review, provide the link to the article. Please don't use WebMD or other fact sites. Science Daily is not primary literature, but it can lead you to one. The other place to go is google scholar. If you are not sure, then email the link to me in advance and give me enough time to get back to you.

### Lab Practical Schedule

Exam 1: 3/20, 8:30 am - 9:35 am

Exam 2: 5/8, 8:30 am - 9:35 am

### Office Hours

#### OFFICE HOURS

**This class has 1 office hour. The meeting can be by phone upon request; however, the preference is for an online live meeting using Google**

**Meet: [meet.google.com/efn-pvsvy-exj](https://meet.google.com/efn-pvsvy-exj). For lab, office hours occur immediately after class, but are available upon request. I will return all emails in**

**regards to office hours within 24 hours. Also, weekends and holidays will have a slower response.**

## PHYL 141 Lab Manuals

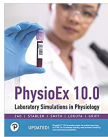
A&P Lab Manual 1 word document ([click here](#))

A&P Lab Manual 1 pdf ([click here](#))

A&P Histology Manual pdf ([click here](#))

Reference Anatomy and Physiology Openstax Textbook ([click here](#))

PHYSIOEX 10 (click on the hyperlink here [PhysioEx 10](#) to purchase



**You need the printed lab manual or online lab manual with access to the program**

## LAB WAIVER

Please fill out the [lab waiver](#) to participate in lab. If you are under 18 at the start of this class you will need your parents signature (online).

## PHYL 141L Supply List (online only)

Pulse oximeter (~\$30) Amazon



Tuning forks (\$15.90 Amazon)

Tuning Fork Set of 5 for Nursing, Medical and Music Students

(C128, C256, C512, C1024 & C2048) Zipper Case Included



AsaTechmed Snellen Plastic Eye Chart with LED Penlight Pupil Gauge

+ Taylor Hammer + Tape Measure + 4 Color Pen (\$8.99 Amazon)



Body Fat Caliper and Measuring Tape for Body - Skinfold Calipers and Body Fat Tape Measure Tool for Accurately Measuring BMI Skin Fold Fitness and Weight-Loss - Upgraded New Design (Black) (\$7.99 Amazon)



**Science First Science First Two-Point Touch Discriminator Item #: 1399043**

\$5.62 free shipping

<https://www.schoolspecialty.com/>



[https://www.schoolspecialty.com/science-first-two-point-touch-discriminator-1399043?kxconfid=u7avswvjn&source=google&campaignid=\(ROI\)\\_Shopping\\_Smart\\_Science\\_Middle\\_Margin&placement=shopping&keyword=&gclid=EAlaQobChMI-sX8k8Og6wIVZRitBh2RKQ1dEAQYASABEgK9GfD\\_BwE](https://www.schoolspecialty.com/science-first-two-point-touch-discriminator-1399043?kxconfid=u7avswvjn&source=google&campaignid=(ROI)_Shopping_Smart_Science_Middle_Margin&placement=shopping&keyword=&gclid=EAlaQobChMI-sX8k8Og6wIVZRitBh2RKQ1dEAQYASABEgK9GfD_BwE)



Human torso model (~\$30 Amazon)

Human Body Model Torso Anatomy Doll 15 Removable Parts Skeleton Visceral Brain with Detailed Manual 10.5inch Height

**Brand Name** Huakan

**Number of Items** 1

**Part Number** huamodelbody01

**UNSPSC Code** 42152400



**OPTIONAL:** The following are slightly pricey, but if you have a little extra money they are nice to have.

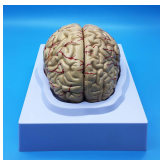
Ultrassist Human Muscle Figure, 20" Miniature Anatomy Muscular Model, Ideal Displaying & Visualizing Model of Superficial Structure of Human Muscle Body, 3 Years Warranty \$88.69 Amazon



Medical Anatomical Skull Model - 1:1 Life Size Replica Anatomy Adult Human Head Bone for Science Lab, Educational \$36.99 Amazon



Learning Resources Human Brain Anatomical Model, Anatomically Accurate Brain Model Life Size Human Brain Anatomy for Science Classroom Study Display Teaching Model \$45.99 Amazon



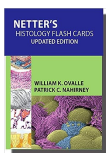
Human Eye Anatomical Model - Dissectible into 6 Parts \$29.99 Amazon



Doc.Royal Human Professional Desktop Ear Joint Simulation Model Medical Anatomy PVC Plastic Type DR-XF-102 \$25 Amazon



**Netter's Histology Flash Cards, Updated Edition 1st Edition \$31**



Anatomy Flashcards Cards \$29



## PHYL 141L Online Websites

### Microscope Websites:

Virtual Microscope NC BIONETWORK:

<https://www.ncbionetwork.org/educational-resources/elearning/interactive-elearning-tools/virtual-microscope>

Virtual Slide List:

<https://histology.medicine.umich.edu/full-slide-list>

Histology Guide

<http://histologyguide.com> slide box

### Dissections:

Eye dissection

[https://www.youtube.com/watch?v=6mNs\\_TcUyHc&has\\_verified=1](https://www.youtube.com/watch?v=6mNs_TcUyHc&has_verified=1)

Sheep Brain dissection

[https://youtu.be/vE3Yf\\_xy\\_mE](https://youtu.be/vE3Yf_xy_mE)

### Reflexes:

Babinski/Plantar in Adult

<https://youtu.be/DkMN6u6Hcts>

Babinski Reflex in infant

<https://youtu.be/b2QKXOzD8sA>

cilioespinal

<https://youtu.be/usvR2Qi4ocY>

pupillary light reflex

<https://youtu.be/HC6WLkWvn-A>

Deep tendon reflexes (includes knee jerk)

<https://youtu.be/0sqCizuotWo>

Eye Dilation Exam:

<https://youtu.be/elAN8KQV588>

<https://youtu.be/M6IIOKXICqs>

## PHYL 141L Grading

Grading for PHYL 141L Online lab only

### Grading:

Laboratory practical exam	2x 250	500 points
Pre-Lab Quizzes (12)		100 points
Lab Manual/PhysioEx exercises		200 points
Lab Notebook		100 points
<u>Attendance</u>		<u>100 points</u>
TOTAL		1000 points

## Primary Literature Article

### What is a primary literature article?

It is original research published as *articles* in peer-reviewed journals, dissertations, technical reports, and conference proceedings. See example: [Three Dimensional Bioprinting of a Vascularized and Perfusable Skin Graft Using Human Keratinocytes, Fibroblasts, Pericytes, and Endothelial Cells](#)

An abstract is a summary of the article. It cannot be used as a reference. You need the full article.

The articles in **Science Daily** are secondary literature. They are summaries of primary literature. If you start there, and you scroll to the bottom of the article you may find the original article (primary source). It sometimes shows as a **DOI** and click the link. [Living skin can now be 3D-printed with blood vessels included](#)

### Journal Reference:

1. Tânia Baltazar, Jonathan Merola, Carolina Motter Catarino, Catherine Bingchan Xie, Nancy Kirkiles-Smith, Vivian Lee, Stéphanie Yuki Kolbeck Hotta, Guohao Dai, Xiaowei Xu, Frederico Castelo Ferreira, W Mark Saltzman, Jordan S Pober, Pankaj Karande. **3D bioprinting of a vascularized and perfusable skin graft using human keratinocytes, (..).** *Tissue Engineering Part A*, 2019; DOI: [10.1089/ten.TEA.2019.0201](#)

If you can't access it, try searching in [GOOGLE SCHOLAR](#). If you still can't access the article, move on.

### Information from Tara Severns, WCC Librarian:

how to [Connect Google Scholar to WCC Databases](#) (the first two minutes are probably the most useful).

[How to Read & Comprehend Scientific Research Articles](#)

[How to Read a Scholarly Article](#)

Characteristics of primary research:

**Primary research is a methodology** in which the **investigators directly collect** and **interpret new data**.

**The results of primary research are reported *by the investigators themselves*.**

Their reports (journal articles, conference presentations, academic theses or dissertations) contain the following sections:

### Publication Information:

- **Author(s):** The names of the people who conducted the study
  - Their institutional affiliations are usually given
- **Title:** This is usually descriptive rather than clever
- Other information, such as conference or journal name, volume, Issue, date, and DOI

**Abstract:** A good abstract summarizes the study: The topic, hypothesis, methodology, results, and conclusions.

- This is sometimes absent or presented on another page.

**Introduction:** This does a few things:

- It provides context for investigation by summarizing what is known about the topic from prior research.
  - This is called a "literature review" and contains *secondary* information.
- It describes what is not yet known, and states why it's important to find out.
- It defines the specific hypothesis to be tested in order to fill that knowledge gap.

**Methodology:** This describes the methods used to collect and analyze the data for the purpose of testing the hypothesis.

**Results:** This presents the aggregated data (adding together or grouping of the raw data), often using charts, images, or tables.

**Discussion:** The investigators present their analysis of the results and what they think it means.

**Conclusion:** Sometimes combined with the Discussion, this outlines:

- The study's contribution to knowledge
- The limitations of the study
- New questions raised by study

**References:** A list citations for the prior research referenced in the Introduction section.

## Lab notebook

**LAB NOTEBOOK** (100 Points): Students are required to maintaining a lab notebook. A lab notebook is a separate composition book used to document experiments, draw microscopic images, and to keep track of valuable lab information. It will be due at the last lab practical.

Videotape your lab notebook. Make sure you have good lighting and that you allow the camera to focus on each page. Count to at least 2 seconds to allow the camera to focus on a page before moving to the next page. The video usually runs about three to five minutes long. You will need to upload it to your google drive or to YouTube and share the link; make sure the link is active and you open share settings so I can view it.

See Assignments: Lab Notebook for grading rubric.

See lab notebook example ([click here](#))

## Lab Report

Please refer to the [Lab Report Document](#) for detailed information.

This report should consist of the following, and be sure to use headings.

1. A descriptive title (1 sentence).
2. Purpose statement (1-2 sentences)
3. Introduction (1 or more paragraphs)
4. A research question (1-2 sentences).
5. A hypothesis (1-2 sentences, including justification).
6. Procedure (materials and methods) (1 paragraph)
7. Results (data table, 1 labeled graph, plus 1-2 sentences) explanation). Graph(s) should be pasted in as pictures.
8. Conclusions (1-2 sentences)
9. References

## Anatomy model videos (all)

Here are all the anatomy models:

[Anatomy Models Videos YouTube](#)