



COLORADO STATE UNIVERSITY
— GLOBAL —

BIO202: HUMAN ANATOMY AND PHYSIOLOGY II WITH LAB

Credit Hours: 4

Contact Hours: This is a 4-credit course, offered in accelerated format. This means that 16 weeks of material is covered in 8 weeks. The exact number of hours per week that you can expect to spend on each course will vary based upon the weekly coursework, as well as your study style and preferences. You should plan to spend 20-24 hours per week in each course reading material, interacting on the discussion boards, writing papers, completing projects, and doing research.

Faculty Information: Faculty contact information and office hours can be found on the faculty profile page.

COURSE DESCRIPTION AND OUTCOMES

Course Description:

BIO202 is the second of a two-course sequence which covers the endocrine, cardiovascular, circulatory, lymphatic, immune, respiratory, digestive, urinary, and reproductive systems. At the conclusion of this course, the student will demonstrate a basic knowledge of the structure and the function all body systems, as well as an understanding of the role of homeostasis in maintaining an environment compatible with life.

Course Overview:

This is the second semester of a two-semester sequence. In this course, students will continue their study of the structure and function of the human body, started in Anatomy and Physiology I. Students will study topics including the endocrine system, the respiratory system, the digestive system, metabolism, the urinary system, the cardiovascular system, fluid-electrolyte balance, and the reproductive system. Students will engage in a virtual and hands-on laboratory experience covering experimentation, microscopy, observations, and dissection.

Course Learning Outcomes:

1. Integrate concepts learned in Anatomy and Physiology I with the concepts introduced in this course.
2. Explain the interrelationship between the anatomical structures and physiological principles of the systems in the human body.
3. Communicate concepts in human anatomy and physiology using appropriate terms.
4. Evaluate topics in anatomy and physiology from an evidence-based perspective.
5. Analyze anatomical structures and physiological function of organ systems using lab procedures.
6. Correlate knowledge of anatomy and physiology to healthy lifestyle decisions and homeostatic imbalances.
7. Perform virtual dissection of the human body (or mammalian) to observe structure of organs and other internal features.

COLORADO GTPATHWAYS COURSE

Colorado Guaranteed Transfer (GT) Pathways Course: The Colorado Commission on Higher Education has approved BIO202 Human Anatomy and Physiology II with Lab for inclusion in the Guaranteed Transfer (GT) Pathways program in the **GT-SC1** category. For transferring students, successful completion with a minimum C–grade guarantees transfer and application of credit in this GT Pathways category. For more information on the GT Pathways program, go to <http://highered.colorado.gov/academics/transfers/gtpathways/curriculum.html>

The table in **Appendix A** details the specific alignment of Course Learning Outcomes and Assessments to gtPathways Content and Criteria requirements.

PARTICIPATION & ATTENDANCE

Prompt and consistent attendance in your online courses is essential for your success at CSU Global Campus. Failure to verify your attendance within the first 7 days of this course may result in your withdrawal. If for some reason you would like to drop a course, please contact your advisor.

Online classes have deadlines, assignments, and participation requirements just like on-campus classes. Budget your time carefully and keep an open line of communication with your instructor. If you are having technical problems, problems with your assignments, or other problems that are impeding your progress, let your instructor know as soon as possible.

COURSE MATERIALS

Required:

OpenStax College. (2019). *Anatomy and physiology*. Houston, TX: OpenStax CNX. Retrieved from <https://openstax.org/details/anatomy-and-physiology>

- Print: ISBN-13: 978-1-938168-13-0
- eBook: ISBN-13: 978-1-947172-04-3

Visible Body: A web-based course software with a two-year membership. This software is paid via student tuition and accessible via the course. This software is used for these courses:

- BIO200 - Human Anatomy and Physiology I with Lab
- BIO202 - Human Anatomy and Physiology II with Lab

Visible Body is a tool that provides 3D modeling of human anatomy and physiology.

Within this course, Visible Body is used for:

- Opening Exercises
- Supplemental Reading
- Required Reading
- Additional personal study, as needed

For more information, check the **Visible Body Student Guide** in the Course Information section.

Carolina Biologicals:

IMPORTANT NOTE! You will need to order your Carolina Biologicals lab kit from the bookstore during the first week.

Your lab kit should contain:

- Introduction to Safety Manual
- Mammalian Heart Dissection
- Urinary Physiology
- Adrenal Gland
- Human Thyroid
- Pituitary Gland
- Aorta
- Artery & Veins
- Vena Cava Human Section
- DL Microscope

NOTE: All non-textbook required readings and materials necessary to complete assignments, discussions, and/or supplemental or required exercises are provided within the course itself. Please read through each course module carefully.

COURSE SCHEDULE

Due Dates

The Academic Week at CSU Global begins on Monday and ends the following Sunday.

- **Discussion Boards:** The original post must be completed by Thursday at 11:59 p.m. MT and Peer Responses posted by Sunday 11:59 p.m. MT. Late posts may not be awarded points.
- **Opening Exercises:** Take the opening exercises in Visible Body before reading each week's content to see which areas you will need to focus on. You may take these exercises as many times as you need. The opening exercises grades are not recorded in your course in Canvas, even though Visible Body records a grade.
- **Mastery Exercises:** Students may access and retake mastery exercises through the last day of class until they achieve the scores they desire.
- **Critical Thinking:** Assignments are due Sunday at 11:59 p.m. MT.
- **Lab Exercises:** Assignments are due Sunday at 11:59 p.m. MT.

WEEKLY READING AND ASSIGNMENT DETAILS

Module 1

Readings

- Chapters 1 – 16 in *Anatomy and Physiology*
- Bailey, R. (2018). Cell membrane function and structure. Retrieved from <https://www.thoughtco.com/cell-membrane-373364>
- Bailey, R. (2019). The Structure of the integumentary system. Retrieved from <https://www.thoughtco.com/integumentary-system-373580>

- Lanese, N. (2019). What is homeostasis? Retrieved from <https://www.livescience.com/65938-homeostasis.html>
- Murphy, A., Muldoon, S., Baker, D., Lastowka, A., Bennett, B., Yang, M., & Bassett, D. (2018). Structure, function, and control of the human musculoskeletal network. *PLoS Biology*, 16(1), e2002811. Retrieved from <https://doi.org/10.1371/journal.pbio.2002811>

Opening Exercise (0 points)

Discussion (25 points)

Critical Thinking (20 points)

Choose one of the following two assignments to complete this week. Do not do both assignments. Identify your assignment choice in the title of your submission.

Option #1: Lab Safety Critique Paper

Lab safety is a critical element when you are performing labs at home. Watch one of the following videos about lab safety:

- General Lab Safety
- Staying Safe in the Dissection Lab

While these videos cover lab safety for the general laboratory and dissection safety, much of the material also applies to labs performed at home. In your paper, discuss the following:

- Highlight six important lab safety tips that apply to home experiments and dissections, and why they are important.
- Based on the information in the videos, discuss where you plan to perform your labs at home and why you think it is the best place. A picture would be nice here!
- Describe what you will wear to perform your labs. A picture would be nice here as well!
- Discuss any safety issues that may arise in your home, such as kids or pets interfering with labs, and how you will prevent issues from arising.
- Describe how you will gather information from your labs to ensure you complete follow up assignment expectations.

Requirements: Create a paper.

- Your paper should be 2-3 pages in length, excluding title and reference pages.
- Include at least two scholarly references, in addition to the course textbook.
 - Conform to the CSU Global Guide to Writing and APA.
 - The CSU Global Library is a good place to find these references.

References:

Amoeba Sisters (2017). General lab safety [Video]. Retrieved from <https://youtu.be/MEIXRLcC6RA>
 El-Haddad, J. (2015). Staying safe in the dissection lab [Video]. Retrieved from https://youtu.be/Ci6MoTsQ_ew

Option #2: Lab Safety Critique Presentation

Lab safety is a critical element when you are performing labs at home. Watch one of the following videos about lab safety:

- General Lab Safety
- Staying Safe in the Dissection Lab

While these videos cover lab safety for the general laboratory and dissection safety, much of the material also applies to labs performed at home. In your paper, discuss the following:

- Highlight six important lab safety tips that apply to home experiments and dissections, and why they are important.
- Based on the information in the videos, discuss where you plan to perform your labs at home and why you think it is the best place. A picture would be nice here!
- Describe what you will wear to perform your labs. A picture would be nice here as well!
- Discuss any safety issues that may arise in your home, such as kids or pets interfering with labs, and how you will prevent issues from arising.
- Describe how you will gather information from your labs to ensure you complete follow up assignment expectations.

Requirements: Create a presentation.

- Consult the CSU Global guidelines for producing a visual presentation prior to working on this assignment.
- Develop a 3-4 slide presentation, not including the title and reference pages, which are required.
- Your presentation MUST either include your script notes containing 80-100 words per slide, and/or your voice over PowerPoint.
- Your presentation must be properly cited and formatted according to the CSU Global Guide to Writing and APA.
- Include a formal references page with at least two scholarly references. The CSU Global Library is a good place to find these references.
- If you create your presentation using Prezi, SlideShare, or some other web-based presentation tool, you will need to copy the link to your presentation with script notes and paste it into a Word document with a brief note to your instructor regarding the link and any special instructions for viewing your project once opened.

References:

Amoeba Sisters (2017). General lab safety [Video]. Retrieved from <https://youtu.be/MEIXRLcC6RA>
El-Haddad, J. (2015). Staying safe in the dissection lab [Video]. Retrieved from https://youtu.be/Ci6MoTsQ_ew

Mastery Exercise (10 points)

Lab: Homeostasis (40 points)

The first lab will cover homeostasis - a topic integral to all of anatomy and physiology. This was covered in the first sequence of anatomy and physiology and will be critical for this second sequence. Having a solid understanding of homeostasis is important.

Equipment

Before beginning the experiment, gather the following items:

- Hand-held mirror or phone with a camera so you can see your face.
- Timer or stopwatch
- Pen
- Paper to record data, preferably with a table ready for data entry

Procedure

This lab will explore how the body reacts to exercise and then returns to a normal state afterwards. Four pieces of data will be gathered: breathing rate, heart rate, perspiration, and how flushed you become while exercising. These will be recorded at four different levels of exercise and a cool down phase where you will gather data three more times. Choose your own exercises if you wish, just make sure the level of intensity increases. Here is a suggested way to increment intensity: completely sedentary, walking slowly, walking fast, and jogging.

Before you begin, make a hypothesis regarding the data you will collect. What do you think will happen as you begin exercising, and then during your cool down? How will your breathing rate, heart rate, perspiration, and level of redness change?

Each exercise will be performed for three minutes, followed by gathering data while still performing the exercise. Prepare a data table ahead of time to record your results. Make sure the stopwatch and mirror are close. Then begin:

1. Perform your first activity, sitting, for three minutes.
2. Start the timer and count the number of breaths you take in 20 seconds. Record your data.
3. Find your pulse below your wrist (not using your thumb) and re-start the timer (holding the timer with you other hand).
4. Count your heartbeats in 20 seconds. Record your data.
5. View yourself in the mirror and record your level of perspiration and how flushed you are. A descriptive scale is fine, just list differences you notice.
6. Repeat steps 1-5 for the next three levels of exercise.
7. Have a seat and repeat steps 1-5 three more times for a total of seven rounds of data collection.

Create a Report or Presentation

Use the following outline to report the data from your lab in a written report or presentation. Label each portion of the lab as follows:

- **Introduction:** Start with a broad discussion of homeostasis and narrow your focus down to the question(s) that you are trying to answer. What are you trying to answer here? Include any observations or background information about homeostasis as well that may pertain to the lab. Conclude the introduction with a hypothesis - a statement that reflects what you believe the outcome of this lab will be.
- **Material List:** Identify all items that you used and the exact quantities as applicable. This may be a very short section.
- **Methods:** Describe how you conducted the experiment, including any safety precautions you took while performing the lab. Be sure to include any changes that you made in the original instructions. Did you use different exercises? This should be a short-paraphrased version of the methods from the lab. Do not copy from the lab or Turnitin will highlight it as plagiarism.
- **Results/Data:** Create a table or a figure that reflects/compares the results of your experiment.
- **Discussion:** Review your results and determine if your experiment supports or refutes your hypothesis. Explain why. Then, expand your discussion and address why and how your body creates the changes you observed as you increased your level of activity and how it returned to a normal state. Be specific and give details.
- **Conclusion:** End with a section describing a topic from the lab that you found particularly intriguing, identify errors that may have impacted your results or errors in the lab itself, and provide recommendations for future labs.

Requirements:

Report

- Your report should be 4-5 pages in length, excluding title and reference pages.
- Include at least two scholarly references, in addition to the course textbook.
 - Conform to the CSU Global Guide to Writing and APA.
 - The CSU Global Library is a good place to find these references.

Presentation

- Consult the CSU Global guidelines for producing a visual presentation prior to working on this assignment.
- Develop a 6-8 slide presentation, not including the title and reference pages, which are required.
- Your presentation MUST either include your script notes containing 80-100 words per slide, and/or your voice over PowerPoint.
- Your presentation must be properly cited and formatted according to the CSU Global Guide to Writing and APA.
- Include a formal references page with at least two scholarly references.
- If you create your presentation using Prezi, SlideShare, or some other web-based presentation tool, you will need to copy the link to your presentation with script notes and paste it into a Word document with a brief note to your instructor regarding the link and any special instructions for viewing your project once opened.

Module 2

Readings

- Chapter 17 *Anatomy and Physiology*
- Garcia-Reyero, N. (2018). The clandestine organs of the endocrine system. *General and Comparative Endocrinology*, 257, 264–271.
- Wilkenfeld, S., Lin, C., & Frigo, D. (2018). Communication between genomic and non-genomic signaling events coordinate steroid hormone actions. *Steroids*, 133, 2–7.

Opening Exercise (0 points)

Discussion (25 points)

Critical Thinking (35 points)

Choose one of the following two assignments to complete this week. Do not do both assignments. Identify your assignment choice in the title of your submission.

Option #1: The Role of the Pancreas in the Homeostasis of Blood Glucose

The pancreas is a single gland that functions as an exocrine and an endocrine gland. The purpose of this paper is to understand the role of the pancreas in controlling the homeostasis of glucose in the blood.

Procedure: Log in to Visible Body.

Go to:

- Endocrine System

Explore the following sections in Endocrine Organs and Functions:

- 26.11 Pancreas
- 26.14 Blood Glucose Level

Once reviewed, in your paper, provide a brief overview of the anatomy of the pancreas. Then, discuss how the pancreas controls glucose levels in the blood, including a description to the two main hormones (glucagon and insulin) involved and their effects.

Summarize your information by discussing how obesity and diets high in sugar are contributing to the rise in Type 1 and Type 2 diabetes mellitus in this country. What are the differences between Type 1 and Type 2? What health behaviors are necessary to reverse the increased trend in diabetes mellitus in this country?

Requirements: Create a paper.

- Your paper should be 2-3 pages in length, excluding title and reference pages.
- Include at least two scholarly references, in addition to the course textbook.
 - Conform to the CSU Global Guide to Writing and APA.
 - The CSU Global Library is a good place to find these references.

Option #2: The Role of the Pituitary Gland in the Regulation of Other Hormones

The pituitary gland consists of two separate glands: the anterior pituitary gland and the posterior pituitary gland. The purpose of this paper is to understand the role of the pituitary gland in the regulation of other hormones in the body.

Procedure: Log in to Visible Body.

Go to:

- Endocrine System
 - 24 Introduction: Endocrine System
 - 24.2 Primary Endocrine Organs

Go to:

- Hormone Action and Regulation

Review:

- 25.3 Hypothalamus and Pituitary
- 25.10 Target Organs of Pituitary Hormones

Once reviewed, in your paper, provide a brief overview of the anatomy of the pituitary gland. Describe the hormones that are released from each gland, explaining what triggers the release of hormones, identifying characteristics that they have in common, and classifying which hormones are considered to be tropic hormones.

Summarize your information by explaining why the pituitary gland is commonly referred to as the “master gland”, and in what sense this may be misleading and incorrect.

Requirements: Create a paper.

- Your paper should be 2-3 pages in length, excluding title and reference pages.

- Include at least two scholarly references, in addition to the course textbook.
 - Conform to the CSU Global Guide to Writing and APA.
 - The CSU Global Library is a good place to find these references.

Mastery Exercise (10 points)

Lab: Tissue and Hormones of the Endocrine System (35 points)

This is a hands-on laboratory exercise that explores what tissues of the endocrine system look like at low, medium, and high-power magnification. The tissues include the pituitary gland, the thyroid gland, and the adrenal gland.

Using your microscope, once you have examined the tissue slides from your lab kit, you will then watch this brief video titled: Tropic vs. Non-tropic Hormones. Next, you will write up a lab report or create a presentation explaining the differences between the gland tissues, and the differences between tropic and non-tropic hormones.

Procedure:

Complete the hands-on lab from your lab kit and required video exercise. Write up a lab report or create a presentation.

Create a Report or Presentation:

Use the following outline to report the data from your lab in a report or presentation. Label each portion of the lab as follows:

- **Introduction:** Start with a broad discussion of the endocrine system. Why is this topic of interest? What will you learn?
- **Material List:** Tissue slides used with a brief note on each.
- **Methods:** Describe how you conducted the experiment, including any safety precautions you took while performing the lab. Be sure to include any changes that you made in the original instructions. This should be a short, paraphrased version of the methods from the lab.
- **Results/Data:** Insert all images and tables from the lab here, with a brief statement about each one.
- **Discussion:** Review what you observed here with a brief discussion about every tissue examined. What differences did you notice as you explored the magnified tissues? What are you comparing and what are some differences you expect to see? What types of hormones do the tissues secrete and where do they act? What do they do? What other differences or interesting characteristics did you notice while performing this lab? Define tropic and non-tropic hormones and how they relate.
- **Conclusion:** End with a section describing what was particularly interesting to you in this lab, identify errors that may have impacted your results or errors in the lab itself, and provide recommendations for future labs.

Requirements: Create a paper or presentation.

Paper

- Your paper should be 4-5 pages in length, excluding title and reference pages.
- Include at least two scholarly references, in addition to the course textbook.
 - Conform to the CSU Global Guide to Writing and APA.
 - The CSU Global Library is a good place to find these references.

Presentation

- Consult the CSU Global guidelines for producing a visual presentation prior to working on this assignment.
- Develop a 6-8 slide presentation, not including the title and reference pages, which are required.
- Your presentation MUST either include your script notes containing 80-100 words per slide, and/or your voice over PowerPoint.
- Your presentation must be properly cited and formatted according to the CSU Global Guide to Writing and APA.
- Include a formal references page with at least two scholarly references.
- If you create your presentation using Prezi, SlideShare, or some other web-based presentation tool, you will need to copy the link to your presentation with script notes and paste it into a Word document with a brief note to your instructor regarding the link and any special instructions for viewing your project once opened.

Module 3

Readings

- Chapters 18 & 19 in *Anatomy and Physiology*
- Boselli, F., Freund, J., & Vermot, J. (2015). Blood flow mechanics in cardiovascular development. *Cellular and Molecular Life Sciences*, 72(13), 2545–2559. Retrieved from <https://doi.org/10.1007/s00018-015-1885-3>
- Myers, B. (2017). Corticolimbic regulation of cardiovascular responses to stress. *Physiology & Behavior*, 172, 49–59.

Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)

Critical Thinking (35 points)

Choose one of the following two assignments to complete this week. Do not do both assignments. Identify your assignment choice in the title of your submission.

Option #1: Differences in Hearts

Every person has a unique set of circumstances that lead to a unique heart, but there are some trends where we see consistent similarities. For example, how do most runners' hearts perform differently from the average non-runner? How do infant hearts work differently from adult hearts? Is there a difference in male and female hearts? Pick any two groups of people that interest you (they do not have to be one of the groups just mentioned) to compare in this assignment.

Address the following points in your paper:

- Describe the function of the heart.
- Trace the flow of blood through the heart to the rest of the body.
- Describe what a healthy heart sounds like, what a healthy heart rate is, and what a healthy blood pressure is.
- Compare and contrast heart sounds, heart rate, and blood pressure in the two groups of focus for the paper.

- Are the sounds, heart rate, and blood pressure in these groups of people healthy, or is there a problem? Explain.
- What was most interesting about comparing these two groups?

Requirements: Create a paper.

- Your paper should be 2-3 pages in length, excluding title and reference pages.
- Include at least two scholarly references, in addition to the course textbook.
 - Conform to the CSU Global Guide to Writing and APA.
 - The CSU Global Library is a good place to find these references.

Option #2: The Impact of Difference Lifestyles on the Heart

Lifestyles and addictions affect the heart, such as smoking, alcoholism, drugs, sedentary lifestyles, vegetarianism, etc. In this paper, explore the impact of a lifestyle on the heart. It can be something perceived as negative or positive and does not have to be one mentioned above.

Address the following points in your paper:

- Describe the function of the heart.
- Trace the flow of blood through the heart to the rest of the body.
- Describe what a healthy heart sounds like, what a healthy heart rate is, and what a healthy blood pressure is.
- Describe the lifestyle or addiction chosen and how it affects the heart. Does blood pressure or heart rate change? Why?
- What lasting problems or benefits could occur?
- Are other organs affected as well?

Requirements: Create a paper.

- Your paper should be 2-3 pages in length, excluding title and reference pages.
- Include at least two scholarly references, in addition to the course textbook.
 - Conform to the CSU Global Guide to Writing and APA.
 - The CSU Global Library is a good place to find these references.

Lab: Sheep Heart Dissection (50 points)

Since sheep have a four-chambered heart like humans, it allows you to relate it to that of a human heart. This will be a virtual and hands-on lab exercise that explores the heart from the micro to macro level. Using the slides in your lab kit, you will view magnified tissue in the aorta, veins, and arteries. Next, you will virtually review the flow of blood through the heart. Once completed, you will set up for dissection, you will review a guide to a virtual sheep heart dissection, and then complete a hands-on dissection of a sheep heart.

Equipment Needed: Safety glasses, gloves, sheep heart, lab tray, supplies kit, pen, and sheep heart dissection diagram worksheets.

Preparation: Before you begin, briefly review the heart blood flow, vessels, and circulation.

Procedure: Log in to Visible Body.

Go to:

- The Cardiovascular System: Blood Vessels and Circulation
 - Modules - The Heart

Explore the following sections:

- 29.15 – 29.21

Go to:

- Modules: Blood Vessels

Explore the following sections:

- 30.1
- 30.2
- 30.5
- 30.10

Next, using the slides in your lab kit, you will view magnified tissue in the aorta, veins, and arteries. Finally, you will review the sheep heart dissection guide. This will familiarize you with the terms you will use as you dissect your heart and walk you through the steps to dissect your heart.

Once you have reviewed this guide, scroll to the bottom of this website page and print the following diagram worksheets in color:

- External anatomy: label the valves
- Internal anatomy: label the right side
- Internal anatomy: label the left side

You will complete these worksheets during or after your dissection by labeling images. You will be submitting these diagram worksheets along with your assignment at the end of your dissection.

Procedure:

Complete all diagram worksheets in the hands-on labs experiment about the cardiovascular system by labeling images.

Create a Report or Presentation:

Use the following outline to report the data from your lab in a written report or presentation. Label each portion of the lab as follows:

- **Introduction:** Start with a broad discussion of the heart. Why is this a topic of interest? What will you learn? Conclude the introduction with a statement about specific items the lab is exploring. What are you comparing and what are some differences you expect to see?
- **Material List:** Identify all items that you used.
- **Methods:** Describe how you conducted the experiment, including any safety precautions you took while performing the lab.
- **Results/Data:** Attach all labeled images from the lab with a brief statement about each diagram worksheet.
- **Discussion:** Review what you observed in the tissue slides and in the hands-on dissection. What differences did you notice as you explored the magnified tissues? How are veins and arteries different? What are some things you noticed about the sheep heart? Are there differences between the right and left side? Why might this be? What other differences or interesting characteristics did you notice while performing this lab?
- **Conclusion:** End with a section describing what was particularly interesting to you, identify errors that may have impacted your results or errors in the lab itself, and provide recommendations for future labs.

Requirements: Create a paper or presentation.

Report

- Your report should be 4-5 pages in length, excluding title and reference pages.
- See *Discussion* above for details.
- Include at least two scholarly references, in addition to the course textbook.
 - Conform to the CSU Global Guide to Writing and APA.
 - The CSU Global Library is a good place to find these references.

Presentation

- Consult the CSU Global guidelines for producing a visual presentation prior to working on this assignment.
- Develop a 6-8 slide presentation, not including the title and reference pages, which are required.
- See *Discussion* above for details.
- Your presentation MUST either include your script notes containing 80-100 words per slide, and/or your voice over PowerPoint.
- Your presentation must be properly cited and formatted according to the CSU Global Guide to Writing and APA.
- Include a formal references page with at least two scholarly references.
- If you create your presentation using Prezi, SlideShare, or some other web-based presentation tool, you will need to copy the link to your presentation with script notes and paste it into a Word document with a brief note to your instructor regarding the link and any special instructions for viewing your project once opened.

Module 4

Readings

- Chapters 20 & 21 in *Anatomy and Physiology*
- Beloeil, H., Ruchard, D., Drewniak, N., & Molliex, S. (2017). Overuse of preoperative laboratory coagulation testing and ABO blood typing: a French national study. *British Journal of Anaesthesia*, *119*(6), 1186–1193. Retrieved from <https://doi.org/10.1093/bja/aex268>
- Liao, S., & Von der Weid, P. (2015). Lymphatic system: An active pathway for immune protection. *Seminars in Cell and Developmental Biology*, *38*, 83-89.

Opening Exercise (0 points)

Discussion (25 points)

Lab: Antigens and Blood Typing (35 points)

In this lab, you will complete a simulation about a car crash and the importance of proper blood typing for blood transfusions. Please follow these instructions to complete your online lab for this module:

1. Read *The Blood Typing Game*.
2. Then, click **Play the Blood Typing Game** near top of page within the discussion.
3. Then, click on **Proceed** at the bottom right of the page.
4. On the screen that says, “**Select Game Type**”, click **Quick Game – random patients** on the left.
5. The next screen should say **Car Crash Victims**. Click **Main Menu** on the top right of the screen.
6. On the Main Menu screen, read three brief tutorials on the left and answer the following questions.

[Note: After reading the tutorial, click **BACK**, which is in small print on the right side of the burgundy blood typing logo at the top of the page.]

Lab Exercise Readiness Questions

- In what year did Karl Landsteiner discover ABO human blood groups?
- Later, in 1940, Landsteiner discovered another blood group. What was the name of that blood group system?
- According to Tutorial 1, how many blood types are there?
- To determine blood type, you need to know what antigens are present. What antibodies are contained in the three types of reagents?
- After mixing the reagent with the blood samples, what does agglutination of the sample indicate? Describe what happens when blood agglutinates.
- If a person has lost blood due to an injury, surgery, or has anemia, what is the most commonly transfused part of the blood?
- Explain what happens if a person receives the wrong blood in a transfusion?
- What does the term *compatible blood* mean in relationship to blood transfusions?
- What happens in emergencies when there is not time for blood typing?

After completing the lab, when you write your report or create your presentation, integrate the answers to these questions in your introduction and discussion where they would be appropriate.

Then proceed with the rest of the lab:

7. Now that you are familiar with how the game is played, click **Start Playing** on the right.
8. The first screen will ask you to select a patient. Since you will test all three patients, select any one of the three patients.
9. Follow the instructions in the call-outs to draw blood and drop blood into all three of the test tubes. You will then choose the patient's blood type and Rh factor.

If you are incorrect, you will get a message that says, "You're bloody wrong. Try again". Try again by clicking the drop of blood with an X in the center on the right. You can continue to try until you receive the message says, "You're bloody right".

After you identify the blood type correctly, click on the drop of blood with the X in the center. This will take you to "Blood Transfusion", where you will select the compatible blood for the patient's transfusion. Note that on the bottom left, it states the number of blood bags required.

An arrow on the right side of the blood bags will allow you to access additional compatible samples.

10. Continue to play this game until you are able to save the lives of your three patients. Click **Back**, which is at the very top right corner of the page. This will take you to a screen which will take you back to the game types.
11. Select the middle game, **Mission Based Game**. Register for the game using your CSU Global email address. Play each of the six missions at least one time. When completed, list the following information:
 - number of blood-typed patients
 - number of administered blood bags

- number of treated patients
12. After completing this lab, draft your Formal Lab Report. The outline and structure for your Formal Lab Report are below:

Create a Report or Presentation

Use the following outline to report the data from your lab in a written report or presentation. Label each portion of the lab as follows:

- **Introduction:** Start with a broad discussion about blood and its importance and narrow your focus down to the topic of the lab. Be sure to describe the ABO blood types and the Rh factor. Discussion of some of the readiness questions would be appropriate here as well. Conclude the introduction with a statement that reflects what you expect to observe during this lab.
- **Material List:** Identify all items that you used and the exact quantities as applicable. This may be a very short section.
- **Methods:** Describe how you conducted the experiment, including any safety precautions you took while performing the lab. Be sure to include any changes that you made in the original instructions. This should be a short, paraphrased version of the methods from the lab. Do not copy from the lab or Turnitin will highlight it as plagiarism.
- **Results/Data:** Create a table or a figure that reflects/compares the results of your experiment.
- **Discussion:** Review your results and discuss whether they were expected. Explain why. Bring in relevant details to expand on the topic. Discuss why proper blood types are important when someone is in an accident. Do you know your blood type or the blood type of your family members? Discussion of some of the readiness questions would be appropriate here, too.
- **Conclusion:** End with a section describing something that intrigued you about the lab, identify errors that may have impacted your results or errors in the lab itself, and provide recommendations for future labs.

Report

- Your report should be 3-4 pages in length, excluding title and reference pages.
- See *Discussion* above for details.
- Include at least two scholarly references, in addition to the course textbook.
 - Conform to the CSU Global Guide to Writing and APA.
 - The CSU Global Library is a good place to find these references.

Presentation

- Consult the CSU Global guidelines for producing a visual presentation prior to working on this assignment.
- Develop a 5-7 slide presentation, not including the title and reference pages, which are required.
- Your presentation **MUST** either include your script notes containing 80-100 words per slide, and/or your voice over PowerPoint.
- Your presentation must be properly cited and formatted according to the CSU Global Guide to Writing and APA.
- Include a formal references page with at least two scholarly references.
- If you create your presentation using Prezi, SlideShare, or some other web-based presentation tool, you will need to copy the link to your presentation with script notes and paste it into a Word document with a brief note to your instructor regarding the link and any special instructions for viewing your project once opened.

Reference:

The Nobel Prize. (2018). The blood typing game. Retrieved from <https://educationalgames.nobelprize.org/educational/medicine/bloodtypinggame/index.html>

Midterm (100 points)

Module 5

Readings

- Chapter 22 in *Anatomy and Physiology*
- Hage, J., & Brinkman, R. (2016). Andreas Vesalius' understanding of pulmonary ventilation. *Respiratory Physiology & Neurobiology*, 231, 37–44.
- Mezzani, A., Pistono, M., Agostoni, P., Giordano, A., Gnemmi, M., Imparato, A., & Corrà, U. (2018). Exercise gas exchange in continuous-flow left ventricular assist device recipients. *PLoS One*, 13(6), e0187112. Retrieved from <https://doi.org/10.1371/journal.pone.0187112>
- Sviriaeva, E., Korneev, K., Drutskaya, M., & Kuprash, D. (2016). Mechanisms of changes in immune response during bacterial coinfections of the respiratory tract. *Biochemistry (Moscow)*, 81(11), 1340–1349.

Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)

Critical Thinking (55 points)

Choose one of the following two assignments to complete this week. Do not do both assignments. Identify your assignment choice in the title of your submission.

Option #1: Gas Laws and Respiration

Respiration involves the exchange of gas across a semipermeable membrane from a liquid medium into air that is housed in a chamber - the lungs. There are five laws related to gas that are particularly important to respiration: Boyle's law, Charles's law, Dalton's law, Henry's law, and Fick's law. Write a paper that addresses all of the following points for each law:

- Explain the law.
- Describe why it is important for respiration.
- Provide an example of the application of this law.
- Wrap up the paper with a discussion of how these laws interact to create a working respiratory system.

Requirements: Create a paper.

- Your paper should be 3-4 pages in length, excluding title and reference pages.
- Include at least two scholarly references, in addition to the course textbook.
 - Conform to the CSU Global Guide to Writing and APA.
 - The CSU Global Library is a good place to find these references.

Option #2: The Relationship Between the Respiratory System and the Circulatory System

The circulatory system is intimately linked to the respiratory system by the exchange of gas between them. Write a paper discussing this link. Be sure to address the following points:

- Explain the exchange of oxygen and carbon dioxide between the lungs and blood.
- What role does Fick's law play in gas exchange?

- Describe the impact of temperature, pH, BPG, and PCO₂ on oxygen loading.
- It has been suggested that loading the body with extra oxygen just before, or during, exercise can enhance performance. Explain how this concept works. Do you think it is possible to enhance performance by oxygen loading just before exercise? Why or why not? Would it be safe?

Requirements: Create a paper.

- Your paper should be 3-4 pages in length, excluding title and reference pages.
- Include at least two scholarly references, in addition to the course textbook.
 - Conform to the CSU Global Guide to Writing and APA.
 - The CSU Global Library is a good place to find these references.

Lab: Respiration at Rest vs. Exercising (35 points)

This is a hands-on laboratory experiment that explores the difference in respiration at rest and during exercise. Students will explore their respiratory rate and the factors that impact that rate.

Equipment Needed: Timer or clock with second hand, pen, and paper.

Procedure

You will determine your respiratory rate at rest and then while exercising. To determine your respiratory rate, you count how many breaths you take in a full minute. Turn to a clock or use a timer and count the number of breaths in 2 full minutes. You will do this three times. Add all three pre-exercise respiratory rates up and divide by three to find your average respiratory rate. Record this on a piece of paper.

Next, you will determine what your respiratory rate is after exercising. You will walk or run in place for 2 minutes. Immediately when you stop walking or running, count your breaths you take in a full minute. You will do this three times. Add all three post-exercise respiratory rates up and divide by three to find your average respiratory rate. Record this on a piece of paper.

NOTE: Students who are unable to stand/walk/run may not be able to perform this exercise. If you are unable to complete the physical portion of this exercise, you may use a partner or friend to complete the exercise while you time, measure, and record their respiratory rates.

Create a Report or Presentation

Use the following outline to report the data from your lab in a written report or presentation. Label each portion of the lab as follows:

- **Introduction:** Start with a broad discussion of the lungs and how they help us function on an everyday basis. Then, note any observations or background information about the lungs that may pertain to the lab. Conclude the introduction with a hypothesis - a statement that reflects what you believe the outcome of this lab will be. What are you comparing and what do you expect will happen?
- **Material List:** Identify all items that you used. This may be a very short section.
- **Methods:** Describe how you conducted the experiment, including any safety precautions you took while performing the lab. Be sure to include any changes that you made in the original instructions. Did you use different exercises or modify the exercises?
- **Results/Data:** Create a table or a figure that reflects/compares the results of your experiment.
- **Discussion:** Review your results and determine if your experiment supports or refutes your hypothesis. Explain why. Then, expand your discussion and address why and how your body creates the changes you observed as you increased your level of activity. Be specific and give

details. What impact would changes to your lifestyle, such as increasing or decreasing your regular level of activity, have on the values you calculated?

- **Conclusion:** End with a section describing something that intrigued you about the lab, identify errors that may have impacted your results or errors in the lab itself, and provide recommendations for future labs.

Report

- Your report should be 4-5 pages in length, excluding title and reference pages.
- Include at least two scholarly references, in addition to the course textbook.
 - Conform to the CSU Global Guide to Writing and APA.
 - The CSU Global Library is a good place to find these references.

Presentation

- Consult the CSU Global guidelines for producing a visual presentation prior to working on this assignment.
- Develop a 6-8 slide presentation, not including the title and reference pages, which are required.
- Your presentation MUST either include your script notes containing 80-100 words per slide, and/or your voice over PowerPoint.
- Your presentation must be properly cited and formatted according to the CSU Global Guide to Writing and APA.
- Include a formal references page with at least two scholarly references.
- If you create your presentation using Prezi, SlideShare, or some other web-based presentation tool, you will need to copy the link to your presentation with script notes and paste it into a Word document with a brief note to your instructor regarding the link and any special instructions for viewing your project once opened.

Module 6

Readings

- Chapters 23 & 24 in *Anatomy and Physiology*
- Giacco, R., Costabile, G., & Riccardi, G. (2016). Metabolic effects of dietary carbohydrates: The importance of food digestion. *Food Research International*, 88, 336–341.
- Zorn, A. (2017). Development of the digestive system. *Seminars in Cell and Developmental Biology*, 66, 1–2.

Opening Exercise (0 points)

Discussion (25 points)

Critical Thinking (45 points)

Choose one of the following two assignments to complete this week. Do not do both assignments. Identify your assignment choice in the title of your submission.

Option #1: Tracking a Bolus of Food

Read the required international article from your readings titled: “Metabolic effects of dietary carbohydrates: The importance of food digestion.” The digestive system is designed to process food into molecules that can be absorbed and utilized by the cells of the body. The purpose of this paper is to demonstrate understanding of the body’s ability to utilize nutrients through the processes of digestion

and absorption. To do so, write a paper following a bite of food from the mouth through the digestive tract. Address the following points in your paper:

- Identify the name and function of the different regions of the digestive tract, and the accessory organs of digestion.
- Differentiate between mechanical digestion and chemical digestion, including a discussion of the role of enzymes and hormones in the digestive process.
- Describe the role of the sympathetic and parasympathetic nervous system in digestion.
- Summarize your information by comparing and contrasting the digestion and absorption of carbohydrates, fats, and proteins.

Requirements: Create a paper.

- Your paper should be 2-3 pages in length, excluding title and reference pages.
- Include at least two scholarly references, in addition to the course textbook.
 - Conform to the CSU Global Guide to Writing and APA.
 - The CSU Global Library is a good place to find these references.

Reference:

Giacco, R., Costabile, G., & Riccardi, G. (2016). Metabolic effects of dietary carbohydrates: The importance of food digestion. *Food Research International*, *88*, 336–341.

Option #2: The Impact of Removing a Portion of the Digestive Tract

A treatment that was once popular for morbid obesity was intestinal bypass surgery, a procedure that removed fairly long portions of the jejunum and ileum. Write a paper about intestinal bypass surgery addressing the following points:

- What is morbid obesity and why did this procedure help someone lose weight?
- Is movement in the section of the digestive tract that was removed controlled by the sympathetic or parasympathetic nervous system?
- Does digestion and absorption of carbohydrates, fats, and proteins still work the same way after intestinal bypass surgery?
- Are all enzymes and hormones involved in the digestive process still necessary without these portions of the digestive tract? Explain.
- What are some of the risks associated with intestinal bypass surgery?
- What procedure(s) are now utilized for treating morbid obesity and how does their effect on the body differ from intestinal bypass surgery?

Requirements: Create a paper.

- Your paper should be 2-3 pages in length, excluding title and reference pages.
- Include at least two scholarly references, in addition to the course textbook.
 - Conform to the CSU Global Guide to Writing and APA.
 - The CSU Global Library is a good place to find these references.

Lab: Daily Calorie Intake and Expenditure (35 points)

This is a hands-on lab experiment that explores nutrition, consumption, and expenditure of calories you consume every day.

Procedure

You will start by clicking on the Calorie Calculator to determine your required caloric intake. This is based on your height, weight, and activity level. You will then track the food you consume for a single

day to assess how many calories you eat. Use the data recorded and your calculations to write up a report or prepare a presentation.

Create a Report or Presentation

Use the following outline to report the data from your lab in a written report or presentation. Label each portion of the lab as follows:

- **Introduction:** Start with a broad discussion of nutrition and calories and narrow your focus down to the question(s) that you are trying to answer. What questions could you answer after performing this lab? Conclude the introduction with a hypothesis - a statement that reflects what you believe the outcome of this lab will be.
- **Material List:** Identify all items that you used and the exact quantities as applicable. This may be a very short section.
- **Methods:** Describe how you conducted the experiment, including any safety precautions you took while performing the lab.
- **Results/Data:** Create a table or a figure that reflects/compares the results of your experiment.
- **Discussion:** Review your results and determine if your experiment supports or refutes your hypothesis. Explain why. Then, expand your discussion to address other topics related to activity levels. Does age affect any of the values calculated? What impact do vitamins and minerals have on metabolism? How are they depleted, and how do we replace them? Will you try to make any changes to the food you eat or your regular level of activity after this lab?
- **Conclusion:** End with a section describing something that intrigued you about the lab, identify errors that may have impacted your results or errors in the lab itself, and provide recommendations for future labs.

Report

- Your report should be 4-5 pages in length, excluding title and reference pages.
- Include at least two scholarly references, in addition to the course textbook.
 - Conform to the CSU Global Guide to Writing and APA.
 - The CSU Global Library is a good place to find these references.

Presentation

- Consult the CSU Global guidelines for producing a visual presentation prior to working on this assignment.
- Develop a 6-8 slide presentation, not including the title and reference pages, which are required.
- Your presentation MUST either include your script notes containing 80-100 words per slide, and/or your voice over PowerPoint.
- Your presentation must be properly cited and formatted according to the CSU Global Guide to Writing and APA.
- Include a formal references page with at least two scholarly references.
- If you create your presentation using Prezi, SlideShare, or some other web-based presentation tool, you will need to copy the link to your presentation with script notes and paste it into a Word document with a brief note to your instructor regarding the link and any special instructions for viewing your project once opened.

Reference:

MayoClinic. (2019). Calorie calculator. Retrieved from <https://www.mayoclinic.org/healthy-lifestyle/weight-loss/in-depth/calorie-calculator/itt-20402304>

Module 7

Readings

- Chapters 25 & 26 in *Anatomy and Physiology*
- Chung, S., Moon, J., Yoon, J., Won, K., Lee, H., & Bjornstad, P. (2018). Low urine pH affects the development of metabolic syndrome, associative with the increase of dyslipidemia and dysglycemia: Nationwide cross-sectional study (KNHANES 2013-2015) and a single-center retrospective cohort study. *PLoS ONE*, 13(8), e0202757. Retrieved from <https://doi.org/10.1371/journal.pone.0202757>
- Rubinow, K., Henderson, C., Robinson-Cohen, C., Himmelfarb, J., de Boer, I., Vaisar, T., & Hoofnagle, A. (2017). Kidney function is associated with an altered protein composition of high-density lipoprotein. *Kidney International*, 92(6), 1526–1535. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5696089/>
- Log in to Visible Body. Go to: Urinary System > Modules-Urinary System > Kidney Anatomy and Physiology > Review: 44.3 Kidney Histology

Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)

Lab: Urinalysis (35 points)

This is a hands-on laboratory exercise where you will explore kidney function, analyze urine characteristics, and what can cause those characteristics to change. You will be doing a visual inspection of urine and testing it with urinalysis test strips to assess the concentration of various compounds that may be present.

Procedure

Read the background information on kidney function in the Urinalysis Lab Manual provided in your lab kit. Then, review the materials needed on page 8, and the preparation on page 9. Use your own urine where applicable for these activities. On page 10, begin the first activity of four. Complete all four activities. Record the data from these activities using the tables within. Use that data to write up a report following the directions below for submission. You do not need to submit the activity sheets with your assignment. You will need to submit the pictures taken with your assignment.

Create a Report or Presentation

Use the following outline to report the data from your lab in a written report or presentation. Label each portion of the lab as follows:

- **Introduction:** Start with a broad discussion of urine formation and narrow your focus down to the question(s) that you are trying to answer. Conclude the introduction with a hypothesis - a statement that reflects what you believe the outcome of this lab will be.
- **Material List:** Identify all items that you used and the exact quantities as applicable. This may be a very short section.
- **Methods:** Briefly explain the four activities conducted. Describe how you conducted the experiment, including any safety precautions you took while performing the lab. Be sure to include any changes that you made in the original instructions. This should be a short, paraphrased version of the methods from the lab. Do not copy from the lab manual or Turnitin will highlight it as plagiarism.
- **Results/Data:** Create a table or a figure that reflects/compares the results of your four activities.

- **Discussion:** Review your results and determine if your experiment supports or refutes your hypothesis. Explain why. Then expand your discussion and address why and how your body creates the changes you observed. Be specific and give details.
- **Conclusion:** End with a section describing something that really intrigued you, identify errors that may have impacted your results or errors in the lab itself, and provide recommendations for future labs.

Report

- Your report should be 4-5 pages in length, excluding title and reference pages.
- Include at least two scholarly references, in addition to the course textbook.
 - Conform to the CSU Global Guide to Writing and APA.
 - The CSU Global Library is a good place to find these references.

Presentation

- Consult the CSU Global guidelines for producing a visual presentation prior to working on this assignment.
- Develop a 6-8 slide presentation, not including the title and reference pages, which are required.
- Your presentation MUST either include your script notes containing 80-100 words per slide, and/or your voice over PowerPoint.
- Your presentation must be properly cited and formatted according to the CSU Global Guide to Writing and APA.
- Include a formal references page with at least two scholarly references.
- If you create your presentation using Prezi, SlideShare, or some other web-based presentation tool, you will need to copy the link to your presentation with script notes and paste it into a Word document with a brief note to your instructor regarding the link and any special instructions for viewing your project once opened.

Module 8

Readings

- Chapters 27 & 28 in *Anatomy and Physiology*
- Ainsworth, C. (2017). Womb with a view. *Nature*, 542(7640), 156–158.
- Bailey, R. (2019). How chromosomes determine sex. Retrieved from <https://www.thoughtco.com/how-chromosomes-determine-sex-373288>
- Ho, S., Cheong, A., Adgent, M., Veevers, J., Suen, A., Tam, N., & Williams, C. (2017). Environmental factors, epigenetics, and developmental origin of reproductive disorders. *Reproductive Toxicology*, 68, 85–104.

Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)

Lab: DNA Extraction (35 points)

Your DNA contains all the genes that regulate the appearance and function of your body. They control everything from the color of your hair to metabolism. Not all genes work independently. Some interact with other genes, and some genes also influence more than one trait. The body has an amazingly

complex orchestration of systems that work together for proper functioning of the body. DNA provides the instructions so it all works together.

What does DNA look like though? A small chain of macromolecules wrapped in a helix may be what is depicted in a textbook, but have you ever seen it yourself?

In today's lab, DNA will be extracted from strawberries and one other item of your choice, following the procedures in the attached presentation. Before completing the lab, create a hypothesis about what you think you will see. Which item, the strawberries or the other item of your choice, do you think will provide the most DNA? Why?

Create a Report or Presentation

Use the following outline to report the data from your lab in a written report or presentation. Label each portion of the lab as follows:

- **Introduction:** Start with a broad discussion of DNA, such as the importance of DNA, what it does, how it is inherited, and narrow your focus down to the question(s) that you are trying to answer. What question could you answer with the data you are collecting? Conclude the introduction with your hypothesis about what you will see and how it will differ between the items you are testing.
- **Material List:** Identify all items that you used and the exact quantities as applicable. Was the amount of strawberries different from your other item? This may be a very short section.
- **Methods:** Describe how you conducted the experiment, including any safety precautions you took while performing the lab. Be sure to include any changes that you made in the original instructions as well. Paraphrase the instructions given in the presentation in your own words or Turnitin will highlight it as plagiarism.
- **Results/Data:** Create a table or a figure that reflects/compares the results of your experiment.
- **Discussion:** Review your results and determine if your experiment supports or refutes your hypothesis. Explain why. Bring in relevant details to expand on the focus of the lab. A discussion of the importance of properly functioning DNA would be appropriate here, with examples of genetic diseases that can occur when mutations occur and their impact on individuals. Issues in fetal development caused by genetic changes would also be good.
- **Conclusion:** End with a section describing something that intrigued you, identify errors that may have impacted your results or errors in the lab itself, and provide recommendations for future labs.

Report

- Your report should be 3-4 pages in length, excluding title and reference pages.
- Include at least two scholarly references, in addition to the course textbook.
 - Conform to the CSU Global Guide to Writing and APA.
 - The CSU Global Library is a good place to find these references.

Presentation

- Consult the CSU Global guidelines for producing a visual presentation prior to working on this assignment.
- Develop a 5-7 slide presentation, not including the title and reference pages, which are required.
- Your presentation MUST either include your script notes containing 80-100 words per slide, and/or your voice over PowerPoint.

- Your presentation must be properly cited and formatted according to the CSU Global Guide to Writing and APA.
- Include a formal references page with at least two scholarly references.
- If you create your presentation using Prezi, SlideShare, or some other web-based presentation tool, you will need to copy the link to your presentation with script notes and paste it into a Word document with a brief note to your instructor regarding the link and any special instructions for viewing your project once opened.

Final (150 points)

COURSE POLICIES

Grading Scale	
A	95.0 – 100
A-	90.0 – 94.9
B+	86.7 – 89.9
B	83.3 – 86.6
B-	80.0 – 83.2
C+	75.0 – 79.9
C	70.0 – 74.9
D	60.0 – 69.9
F	59.9 or below

Course Grading

20% Discussion Participation
0% Opening Exercises
6% Mastery Exercises
19% Critical Thinking Assignments
30% Labs
25% Midterm and Final Exam

IN-CLASSROOM POLICIES

For information on late work and incomplete grade policies, please refer to our [In-Classroom Student Policies and Guidelines](#) or the Academic Catalog for comprehensive documentation of CSU Global institutional policies.

Academic Integrity

Students must assume responsibility for maintaining honesty in all work submitted for credit and in any other work designated by the instructor of the course. Academic dishonesty includes cheating, fabrication, facilitating academic dishonesty, plagiarism, reusing /re-purposing your own work (see CSU Global Guide to Writing and APA for percentage of repurposed work that can be used in an assignment), unauthorized possession of academic materials, and unauthorized collaboration. The CSU Global Library provides information on how students can avoid plagiarism by understanding what it is and how to use the Library and Internet resources.

Citing Sources with APA Style

All students are expected to follow the CSU Global Guide to Writing and APA when citing in APA (based on the APA Style Manual, 6th edition) for all assignments. For details on CSU Global APA style, please review the APA resources within the CSU Global Library under the “APA Guide & Resources” link. A link to this document should also be provided within most assignment descriptions in your course.

Disability Services Statement

CSU Global is committed to providing reasonable accommodations for all persons with disabilities. Any student with a documented disability requesting academic accommodations should contact the Disability Resource Coordinator at 720-279-0650 and/or email ada@CSUGlobal.edu for additional information to coordinate reasonable accommodations for students with documented disabilities.

Netiquette

Respect the diversity of opinions among the instructor and classmates and engage with them in a courteous, respectful, and professional manner. All posts and classroom communication must be conducted in accordance with the student code of conduct. Think before you push the Send button. Did you say just what you meant? How will the person on the other end read the words?

Maintain an environment free of harassment, stalking, threats, abuse, insults or humiliation toward the instructor and classmates. This includes, but is not limited to, demeaning written or oral comments of an ethnic, religious, age, disability, sexist (or sexual orientation), or racist nature; and the unwanted sexual advances or intimidations by email, or on discussion boards and other postings within or connected to the online classroom. If you have concerns about something that has been said, please let your instructor know.

APPENDIX A

Colorado General Transfer Pathways Alignment

Course Learning Outcomes	GT Pathways Competencies & Content Criteria	Assessment Methods
<p>CLO1. Apply concepts learned in Anatomy and Physiology I, including homeostasis, organization of the body, and the integumentary, skeletal, muscular, nervous, and sensory systems to the concepts introduced in this course.</p>	<p>CC1a. Develop foundational knowledge in specific field(s) of science.</p>	<p>For CC1a. The first module includes a review of these concepts, and a quiz to assess retention of these foundational concepts.</p>
<p>CLO2. Recognize the interrelationship between the anatomical structures and physiological principles of the cardiovascular, circulatory, respiratory, digestive, endocrine, excretory, and reproductive systems.</p>	<p>CC1a. Develop foundational knowledge in specific field(s) of science.</p>	<p>For CC1a. In every module (2-8) after the review in Module 1, students are introduced to new material to form a basic understanding of anatomy and physiology including the endocrine system, the circulatory system, the cardiovascular system, the respiratory system, the digestive system, the urinary system, and the reproductive system. There is a lab in each of these modules so students can explore the new material and solidify their knowledge of the subject. There are also discussions in every module and critical thinking assignments throughout the class that explore the system of focus for the module.</p>
<p>CLO3. Formulate a working vocabulary associated with human anatomy and physiology in order to communicate related concepts appropriately.</p>	<p>CC1a. Develop foundational knowledge in specific field(s) of science.</p>	<p>For CC1a. Each module introduces new terms that students must learn to complete weekly quizzes, mid-term and final exams, and writing assignments. In the associated lab students explore the differences between arteries and veins, as well as differences between the right and left side of the heart.</p>
<p>CLO4. Evaluate issues related to anatomy and physiology from an evidence-based perspective.</p>	<p>IA4a. Select or develop elements of the methodology or theoretical framework to solve problems in a given discipline.</p>	<p>For IA4a. In Module 2 students discuss the implications of improper levels of hormones on the human body.</p>
<p>CLO5. Demonstrate laboratory procedures used to examine anatomical structures and evaluate physiological</p>	<p>CC1b. Develop an understanding of the nature and process of science.</p>	<p>For CC1b. There is a lab-based assignment in each weekly module that requires a complete lab report or presentation including an</p>

<p>functions of each organ system.</p>	<p>CC1c. Demonstrate the ability to use scientific methodologies.</p> <p>CC1d. Examine quantitative approaches to study natural phenomena.</p> <p>IA5b. Utilize multiple representations to interpret the data.</p> <p>IA6a. State a conclusion based on findings.</p> <p>QL1a. Explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words).</p> <p>QL2a. Convert information into and between various mathematical forms (e.g., equations, graphs, diagrams, tables, words).</p> <p>CC2a. Perform hands-on activities with demonstration and simulation components playing a secondary role.</p>	<p>introduction, materials, methods, results, and a discussion of the results.</p> <p>For CC1c. There is a lab-based assignment in each weekly module that requires the creation of hypotheses and hypothesis testing.</p> <p>For CC1d. The homeostasis lab in Module 1, the respiration lab in Module 5, and the nutrition lab in Module 6 each require students to collect quantitative data to form a better understanding of how the body works.</p> <p>For IA5b. The homeostasis lab in Module 1 and the respiration lab in Module 5 require students to create tables depicting data they collected and then describe and interpret the data.</p> <p>For IA6a. In each weekly lab assignment, students are asked to discuss their findings and form a conclusion about their hypotheses.</p> <p>For QL1a and QL2a. The homeostasis lab in Module 1, the respiration lab in Module 5, and the nutrition lab in Module 6 require students to collect quantitative data. They must create a table and/or figure from their data, describe their results in writing, and interpret this information. They form conclusions and justify their reasoning based on the data they collected.</p> <p>For CC2a: In the Module 1 lab on homeostasis students perform a hands-on lab to assess how the body changes during exercise and then returns to normal by exercising and assessing the changes in their body during and after exercise. In the Module 3 lab on the cardiovascular system students dissect a heart. In the Module 5 lab on respiration students assess tidal volume, minute ventilation, forced vital capacity, and total lung volume when they</p>
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	<p>CC2b. Engage in inquiry-based activities.</p> <p>CC2c. Demonstrate the ability to use the scientific method.</p> <p>CC2d. Obtain and interpret data, and communicate the results of inquiry.</p> <p>CC2e. Demonstrate proper technique and safe practices.</p>	<p>are resting and when they are exercising. In the Module 6 lab students calculate their daily calorie requirements and then track the food they consume to assess how many calories they need to consume each day. In Module 7 students perform a urinalysis on their own urine using urine test strips and by making visual observations. In Module 8 students extract DNA from food items normally found in the kitchen, such as strawberries. In Modules 2 and 4 students perform labs that are simulation based. The Module 2 lab requires students to identify different parts of endocrine tissues at different magnifications. In the Module 4 lab students use a computer simulation to explore the importance of blood types when people are in car accidents and need blood transfusions.</p> <p>For CC2b . All labs ask students to create their own hypothesis and then discuss the results of the lab in relation to the hypothesis in their lab report or presentation.</p> <p>For CC2c. The lab in each module requires the creation of a hypothesis and hypothesis testing. The labs are written up as a complete lab report or presentation that includes an introduction, materials, methods, results, and a discussion of the results.</p> <p>For CC2d. The homeostasis lab in Module 1, the respiration lab in Module 5, the nutrition lab in Module 6, the urinalysis in Module 7, and the DNA extraction in Module 8 all require students to obtain and interpret data in the results and discussion section of their lab report or presentation.</p> <p>For CC2e. In the Module 1 critical thinking assignment, students explore proper lab safety and how to perform labs safely in the home including what they will wear to perform labs and where labs will be performed. All the labs (Modules 1-8) ask students to address safety measures taken while completing the lab in the methods section of the lab report or presentation.</p>
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<p>CLO6. Correlate knowledge of anatomy and physiology to real-world situations, including healthy lifestyle decisions and homeostatic imbalances.</p>	<p>IA5a. Examine evidence to identify patterns, differences, similarities, limitations, and/or implications related to the focus.</p>	<p>For IA5a. In the Module 3 critical thinking assignment students compare the differences between the hearts of two different groups of people, or they assess the impact of different lifestyles on the heart. In the Module 4 discussion students explore the similarities and differences in diseases and vaccinations available in Africa and the United States. In the Module 4 lab students examine the implications of giving a car crash victim the incorrect blood type. The Module 6 discussion evaluates the impact of swallowing different hazardous material.</p>
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CLO – Course Learning Outcome

CC – gtPathways Content Criteria

IA – gtPathways Inquiry and Analysis Competency

QL – gtPathways Quantitative Literacy Competency

NATURAL & PHYSICAL SCIENCES (N&PS) CONTENT CRITERIA – GT-SC1

1. The lecture content of a GT Pathways science course (GT-SC1)
 - a. Develop foundational knowledge in specific field(s) of science.
 - b. Develop an understanding of the nature and process of science.
 - c. Demonstrate the ability to use scientific methodologies.
 - d. Examine quantitative approaches to study natural phenomena.

2. The laboratory (either a combined lecture and laboratory, or a separate laboratory tied to a science lecture course) content of a GT Pathways science course (GT-SC1)
 - a. Perform hands-on activities with demonstration and simulation components playing a secondary role.
 - b. Engage in inquiry-based activities.
 - c. Demonstrate the ability to use the scientific method.
 - d. Obtain and interpret data, and communicate the results of inquiry.
 - e. Demonstrate proper technique and safe practices.

COMPETENCIES & STUDENT LEARNING OUTCOMES FOR GT-SC1

Inquiry & Analysis:

4. Select or Develop a Design Process

- a. Select or develop elements of the methodology or theoretical framework to solve problems in a given discipline.

5. Analyze and Interpret Evidence

- a. Examine evidence to identify patterns, differences, similarities, limitations, and/or implications related to the focus.
- b. Utilize multiple representations to interpret the data.

6. Draw Conclusions

- a. State a conclusion based on findings.

Quantitative Literacy:

1. Interpret Information

- a. Explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words).

2. Represent Information

- a. Convert information into and between various mathematical forms (e.g., equations, graphs, diagrams, tables, words).