



ANAT-102: HUMAN ANATOMY & PHYSIOLOGY II

Effective Term

Fall 2026

BOT Approval Date

05/15/2025

Discipline

ANAT - Anatomy & Physiology

Course Number

102

Course Title

Human Anatomy & Physiology II

Short Title

Human Anatomy & Physiology II

Credit Status (CB 04)

D - Credit - Degree applicable

Units**Lecture Units**

3.00

Lab Units

1.00

Total Units

4.00

Hours**Lecture Contact Hours**

48-54

Out of Class Hours Lecture

96-108

Lab Contact Hours

48-54

Out of Class Hours Lab

0.00

Total Contact Hours

96 - 108

Total Out of Class Hours

96 - 108

Total Student Learning Hours

192 - 216

Is this an existing Extensive Lab?

Yes

**Distance Education**

Yes

Distance Education**Distance Education Type**

Hybrid Only

What will be done in face-to-face meetings

Face-to-face meetings will involve hands on dissections of various organs and use of biodata systems to study anatomy and physiology. Microscopes will also be used to study the microanatomy of various organs and tissues.

Are you using publisher content?

No

Regular Substantive Interaction

Instructor-to-student, student-to-student, and student-to-content contact shall be distributed in a manner that will ensure regular substantive interaction (RSI) is maintained not only weekly but also for the duration of the course. Instructor interactions should be equivalent in time, quality and consistency to the engagement students would receive in a face-to-face course—for example, through announcements, discussion participation, personalized feedback, video messages, or other instructional communications. Instructors are expected to be responsive to student inquiries within a 24-72 hour time frame excluding holidays. RSI will be maintained through a variety of methods:

- Orientation - Students must be oriented to the online and face-to-face portions at the start of the course.
- Announcements - Announcements using the course management system must be posted at least weekly to keep students current on course events, due dates, materials, etc.
- Discussion Forums - Content-related discussion forums within the designated CMS will include appropriate instructor participation and will be initiated and maintained, with timely feedback provided. Instructors are required to monitor the discussions and related activities to provide guidance and direction. Open-ended discussion boards may be used to further learning and interaction.
- MSJC Communication – Instructor will use MSJC-administered communication tools (such as email or the designated CMS communication tools) to regularly communicate with and provide ease of access to students.
- Timely Feedback - Timely feedback on student work will be provided by the instructor, which may include comments and/or rubrics, within the Grades area of the designated CMS.
- Scheduled Meetings – Hybrid and synchronous courses will meet at regularly scheduled times.

ADA Compliance - All course interactions and content must be designed with accessibility in mind and meet ADA requirements.

C-ID (Admin Only)

C-ID BIOL 115S

Catalog Description

This course covers the nervous, endocrine, cardiovascular, lymphatic, respiratory, and urinary systems as well as fluid and electrolyte homeostasis.

Requisites**Prerequisite(s)****Prerequisite(s) (must be taken before)**

ANAT-101 (with a grade of C or better).

Codes**TOP Code (CB 03)**

0410.00 - Anatomy and Physiology

CIP Code

26.0403 - Anatomy.

Repeatability Code

No

Grading Option

Letter grade OR P/NP

**CB 00**

CCC000600340

Transfer Status (CB 05)

A - Transferable to both UC and CSU

Course Units Minimum (CB 07)

4

Basic Skills Status (CB 08)

NB - Non Basic Skills

Cooperative Work Experience (CB 10)

N - Not Part of a Cooperative Work Experience Education Program

Course Classification Status (CB 11)

Y - Credit Course

Educational Assistance Class Instruction (CB 13)

N - Not an Approved Special Class

Prior Transfer Level (CB 21)

Y - Not Applicable

Funding Agency Category (CB 23)

Y - Not Applicable (Funding Not Used)

Program Status (CB 24)

Program Applicable

Course General Education Status (CB 25)

Y - Not applicable

Course Support Course Status (CB 26)

N - Not a support course

Minimum Qualifications

Minimum Qualifications	And/Or
Biological Sciences (Masters Required)	End

GE Information**Check GE Types Requested**

AA/AS A - Natural and Physical Sciences

Cal-GETC Areas**Approved Cal-GETC Area**

AREA-5B

Approved Second Cal-GETC Area

AREA-5C

Learning Objectives

Learning Objectives

Learning Objective

1. Relate the structure to the function of nervous tissue at the cellular, tissue, organ, and organismal level.
2. Differentiate the anatomy and physiology between the sensory input and motor output in the nervous system.
3. Compare and contrast the general and special senses.
4. Compare and contrast the nervous system to the endocrine system with regard to anatomy, physiology and homeostasis.
5. Analyze how the circulatory system functions in the homeostasis of nutrients, wastes, and blood gases.
6. Classify blood cell types to their staining characteristics, granules and function.
7. Examine the anatomy and physiology of nonspecific disease defense and the immune system.
8. Investigate the physiology involved in transport and regulation of blood gases.
9. Integrate the structure to the function of the kidney in the regulation of fluid, electrolyte, and pH balance.
10. Diagram the anatomy of the heart as well as the flow of blood, the conduction system and EKG.
11. Predict the cause and effect relationships with selected pathologies of the nervous, cardiovascular, endocrine, immune, and urinary systems taking into account ethnicity, race, culture and gender in selected pathologies.

Learning Outcome Information

Course Learning Outcomes

Learning Outcome

1. Students will examine the anatomy of a typical neuron and outline the physiological events of the resting and action potential.
2. Students will analyze the structures and the sequence of the electrical conduction of the heart and relate how a typical electrocardiogram is linked to those events.
3. Students will survey the anatomy and physiology of the immune system including both the innate and acquired systems responsible in disease defense.

Program Learning Outcomes

Learning Outcome

1. Apply the principles of natural selection and evolution to predict genetic outcomes.
2. Correlate the structure to function of each of the major systems and their organ and tissue components.
3. Demonstrate an ability to apply scientific methods in Anatomy and Physiology to predict physiologic responses.
4. Predict homeostatic responses to physiological imbalances.
5. Demonstrate an understanding of the fundamental chemical nature of physiology.

Institutional Learning Outcomes

Civic Personal and Professional Responsibility: The student will apply decision making skills which demonstrate ethical and professional responsibility and become an independent learner who expresses and displays the lifelong skills necessary for physical, social, economic, mental and emotional health.

Critical Thinking: The student will analyze problems, gather and synthesize relevant information, evaluate ideas, information, and evaluate alternative points of view to create, innovate and implement effective solutions.

Cultural Awareness and Humility: The student will demonstrate knowledge of and sensitivity toward individuals of diverse ethnicity, age, gender, sexual orientation, and religious affiliations, as well as toward those individuals with diverse abilities and socio-economic classes to respectfully interact with individuals of diverse perspectives, beliefs and values while being mindful of the limitation of their own cultural frameworks.

Information and Technology Literacy: The student will access, interpret, evaluate, and apply relevant information sources and digital media effectively, and in an ethical and legal manner.

Scientific Awareness: The student will apply the scientific method of inquiry to assess potential solutions for real-life challenges by employing science-based knowledge and methodologies in daily life.

Social Awareness: The student will recognize and analyze the interconnectedness of global, national, and local concerns, analyzing cultural, political, social, and environmental issues from multiple perspectives and appreciate similarities and differences among cultures.

Content

Course Lecture Content

1. Nervous tissue
 - a. Nervous system subdivisions
 - b. Histology and physiology of neurons
 - c. Histology and physiology of glia cells
 - d. Events of the resting potential
 - e. Events of the actions potential
 - f. Events of the synapsis
 - g. Neurotransmitters
 - h. Neuronal circuits
 - i. Selected pathologies and their differences in culture, sexuality, and gender.
2. Spinal cord and spinal nerves
 - a. Spinal cord anatomy
 - b. Spinal nerves
 - c. Sensory and motor tracts
 - d. Reflexes
 - e. Selected pathologies and their differences in culture, sexuality, and gender.
3. Brain and cranial nerves
 - a. Meninges
 - b. Cerebral spinal production and flow
 - c. Brain stem
 - i. Medulla oblongata
 - ii. Pons
 - iii. Midbrain
 - d. Reticular formation
 - e. Cerebrum
 - f. Diencephalon
 - i. Thalamus
 - ii. Hypothalamus
 - iii. Epithalamus
 - iv. Circumventricular organs
 - g. Cerebrum
 - i. Lobes
 - ii. Functional cerebral cortex
 - iii. White matter
 - iv. Limbic system
 - v. Basal ganglia
 - h. Cranial nerves
 - i. Homeostatic mechanisms
 - j. Selected pathologies and their differences across races and cultures.
4. Autonomic nervous system
 - a. Neurotransmitter
 - b. Receptors and subtypes
 - c. Sympathetic and parasympathetic divisions
 - d. Homeostatic mechanisms
 - e. Selected pathologies
5. Sensory, motor, and integrative system
 - a. Sensory modalities
 - b. Somatic sensations
 - c. Sensory and motor pathways
 - d. Integrative junctions
 - e. Selected pathologies and their differences in culture, sexuality, and gender.
6. Special senses

-
- a. Olfaction
 - b. Gustation
 - c. Vision
 - d. Hearing
 - e. Equilibrium
 - f. Selected pathologies and their differences in culture, sexuality, and gender.
7. Endocrine system
 - a. Hormones
 - i. Chemistry
 - ii. Hormone receptors
 - iii. Mechanisms of hormone action
 - b. Hypothalamic and pituitary hormones
 - i. Anatomy and physiology of the hypothalamus
 - ii. Anatomy and physiology of the pituitary
 - c. Thyroid anatomy and physiology
 - d. Parathyroid anatomy and physiology
 - e. Adrenal anatomy and physiology
 - f. Pancreatic anatomy and physiology
 - g. Male endocrine anatomy and physiology
 - h. Female endocrine anatomy and physiology
 - i. Selected pathologies and their differences in culture, sexuality, and gender.
 8. Blood
 - a. Functions and characteristics of blood
 - b. Histology and physiology of red blood cells
 - c. Histology and physiology of White blood cells
 - d. Platelets
 - i. 1. Vascular spasm
 - ii. 2. Platelet plug
 - iii. 3. Internal and external clotting
 - e. Homeostatic mechanisms
 - f. Selected pathologies and their differences across races and cultures.
 9. Heart
 - a. Location, layers, chambers and valves of the heart
 - b. Cardiac muscles and the electrical conduction
 - c. Cardiac cycle
 - d. Cardiac output
 - e. Homeostatic mechanisms
 - f. Selected pathologies and their differences in culture, sexuality, and gender.
 10. Blood vessels
 - a. Anatomy of blood vessels
 - b. Capillary exchange
 - c. Hemodynamics
 - d. Blood pressure
 - e. Homeostatic control
 - f. Selected pathologies and their differences in culture, sexuality, and gender.
 11. Lymphatic system
 - a. Anatomy and physiology of the lymphatic system
 - b. Innate immunity
 - c. Adaptive immunity
 - d. Cell-mediated immunity
 - e. Antibody mediated immunity
 - f. Selected pathologies and their differences in culture, sexuality, and gender.
 12. Respiratory system
 - a. Anatomy and physiology of the lymphatic system
 - b. Pulmonary ventilation

- c. Lung volumes and capacities
 - d. Transport of oxygen and carbon dioxide
 - e. Control of breathing
 - f. Homeostatic mechanisms
 - g. Selected pathologies and their differences in culture, sexuality, and gender.
13. Urinary system
- a. Anatomy and physiology of the urinary system
 - b. Glomerular filtration
 - c. Tubular secretion
 - d. Tubular reabsorption
 - e. Urine transport, storage and elimination
 - f. Homeostatic mechanisms
 - g. Selected pathologies and their differences in culture, sexuality, and gender.
14. Fluid and electrolytes
- a. Water sources, regulation, loss and functions
 - b. Electrolyte sources, regulation and functions
 - c. Acid-base balance
 - d. Selected pathologies and their differences in culture, sexuality, and gender.

Course Lab Content

1. Lab Safety, Introduction to biodata system, Cadaver Review
2. Nervous System Introduction and Histology of the Nervous System
3. Spinal Cord, Spinal Nerves, and Peripheral Nerves
4. Testing of Peripheral Nerve Reflexes
5. Brain anatomy
 - a. Models
 - b. Sheep brain Dissection
 - c. Human brain
6. Cranial Nerve Testing
7. Tactile Senses
8. Taste and Tongue Lab
9. Eye Dissection and Model Examination
10. Vision Lab
11. Hearing and Balance
12. Endocrine System Model Study and Histology
13. Heart Dissection
14. Electrocardiogram
15. Blood glucose and challenge test
16. Blood Vessels and Blood Pressure
17. Lymphatic and Immune System Histology and Examination
18. Spirometry Lab
19. Sheep Kidney Dissection
20. Urinalysis

Methods of Instruction

Method

Directed Study

Integration

Case studies will analyze select physiological pathologies, such as diseases of the nervous, cardiovascular, endocrine, immune, and urinary systems, taking into account ethnicity, race, culture, and gender in selected pathologies. Students will read about a particular patient and their condition and answer questions using information from lectures, the textbook, and relevant websites. Cultural, racial, gender, and sexual differences will be addressed when relevant to each case study.

DE Adaptations for MOI

These case studies can be implemented through the CMS system by reading the specific cases, reviewing the online lectures, reading the online textbook, and linking them to relevant websites. Library databases can also help to provide online sources for case studies. DE students will be able to complete the assignment within the CMS system with the accessibility tools that are available in the CMS system.

Method

Experiments

Integration

Laboratory experiments of physiological processes using live specimens (Humans) are integrated, in many cases, with computerized data capture hardware and software. A large assortment of "wet" laboratory experiments that demonstrate various physiological processes will also be conducted. As the students will be put into random groups, individual differences in culture and gender can also be evaluated if they are relevant to the system being studied.

DE Adaptations for MOI

Stock data provided by the bio software as examples will be analyzed with the accessible bio software program in a DE environment.

Method

Discussion

Integration

In the lab, students will work in groups and discuss various pathologies of the nervous, endocrine, cardiovascular, lymphatic, respiratory, and urinary systems, fluid and electrolyte homeostasis, and the role of cultural, race, sexuality, and gender differences in each. Videos, scholarly articles, and lectures will be utilized to encourage student-to-student interaction to complete each lab and engage in discussion of the various topics within each system each week.

DE Adaptations for MOI

DE students will work in discussion groups within the accessible CMS system to discuss the various pathologies of the nervous, endocrine, cardiovascular, lymphatic, respiratory, and urinary systems, fluid and electrolyte homeostasis, and the role of cultural, race, sexuality, and gender differences in each. Accessible videos, scholarly articles, and lectures will be provided within the CMS system for DE students to access and participate in these student-to-student discussions.

Method

Lab Activities

Integration

Laboratory study of anatomical structures will include the dissection of preserved specimens, examination of a human cadaver, and various anatomical models to study the anatomy of the nervous, cardiovascular, endocrine, urinary, and lymphatic systems. Microscopic studies of tissues are included for a number of laboratory activities to study the microscopic anatomy of the nervous, cardiovascular, endocrine, urinary, and lymphatic systems.

DE Adaptations for MOI

Accessible websites for microscopic anatomy, cadaver, and anatomical models will be utilized for the DE student to participate in anatomical studies in a DE environment.

Method

Lecture

Integration

Lecture and Interactive discussions that apply to anatomy, physiology, homeostasis, and pathology will be used to teach students concepts of nervous, endocrine, cardiovascular, lymphatic, respiratory, and urinary systems, as well as fluid and electrolyte homeostasis taking into account race and culture in selected pathologies.

DE Adaptations for MOI

For the distance education (DE) adaptation of the course, lectures will employ a blend of accessible video, audio, or slide presentations of the nervous, endocrine, cardiovascular, lymphatic, respiratory, and urinary systems as well as fluid and electrolyte homeostasis. These lectures will be hosted on the course management system (CMS) platform, ensuring seamless access for remote learners. Students will be able to access lectures conveniently via the assignments area or other conferencing tools within the CMS. In adherence to accessibility standards, efforts will be undertaken to ensure that all students can access the lectures, regardless of their individual requirements. In hybrid courses, online lectures play a pivotal role in the learning process. They can be delivered either synchronously through live accessible video conferencing sessions or asynchronously via pre-recorded lectures available within the CMS. These lectures will be supplemented with presentation materials such as accessible digital slide decks, closed-captioned accessible videos, and relevant external articles to bolster student comprehension. These supplementary resources will be easily accessible to students within the CMS, fostering an inclusive learning environment that caters to diverse learning preferences and needs. Online lectures with included graded questions for student interaction will be implemented in the CMS system. Course material and pertinent information will be delivered to students through interactive presentations supplemented by handouts, digital slide decks, and multimedia to integrate lectures effectively. These methods will elucidate key concepts in the nervous, endocrine, cardiovascular, lymphatic, respiratory, and urinary systems and fluid and electrolyte homeostasis.

Method

Individual Projects

Integration

Students will be asked to orally present on a selected topic that demonstrates an integrated approach to anatomy and physiology as it relates to a specific pathology. They will choose a pathology from one of the following systems: nervous, cardiovascular, endocrine, immune, and urinary systems. They will research its origin, symptoms, treatment, and outcomes, and present their findings in an oral presentation.

DE Adaptations for MOI

The oral report can be recorded and uploaded in to the CMS. Students will utilize diverse multimedia resources such as closed-captioned videos, journals, prerecorded audio/visual materials, or online discussion forums within the course management system (CMS).

Methods of Evaluation**Method**

Exams/Tests

Integration

Comprehensive Final Examination to determine student's synthesis of information of the nervous, cardiovascular, endocrine, immune, and urinary systems, considering ethnicity, race, culture, and gender assigned and discussed in both lecture and lab.

DE Adaptations for MOE

Exams and/or tests administered fully online will be administered, graded, and evaluated through CMS. Exams/tests will be evaluated based on the demonstration of identification, understanding and application of major topics as described in course content in alignment with learning objectives. Exams will be administered in an equitable fashion in true or false, multiple choice, fill-in-the-blanks, and short answers questions. This provides an equitable opportunity for all students. Exams will be submitted to the online grading system within the CMS. Exams will be graded, be evaluated based on accuracy and completeness and students will receive feedback within 2 weeks, via the grade book, chat, or other accessible conferencing tools. These issues encompass a wide range of topics, including sex, gender, culture, and race, as they relate to each organ system. For instance, exams/tests may be designed to evaluate students' understanding of the transmission of a nerve action potential and its integration in the central nervous system. Through these assessments, students will be challenged to critically analyze and apply their understanding of the nervous, cardiovascular, endocrine, immune, and urinary systems, taking into account ethnicity, race, culture, and gender in selected pathologies, exhibiting a comprehensive grasp of the subject matter.

Method

Quizzes

Integration

Quizzes will be given at the end of each lab to determine understanding of the material presented in each of the following systems (nervous, cardiovascular, endocrine, immune, and urinary systems) each week.

DE Adaptations for MOE

In a DE adaptation quizzes will be given at the end of each lab module with the accessible CMS environment.

Method

Group Projects

Integration

Group project/lab reports will be evaluated by a rubric that outlines the analysis of homeostatic mechanisms within the nervous, cardiovascular, endocrine, immune, and urinary systems. The rubric evaluates the student's ability to tie homeostatic mechanisms to a variety of influences, both internally and externally, taking into account culture, sexuality, and gender.

DE Adaptations for MOE

In a DE setting, the accessible CMS system will be utilized to form student groups allowing DE students to complete group projects on nervous, cardiovascular, endocrine, immune, and urinary systems. The rubric evaluates the student's ability to tie homeostatic mechanisms to a variety of influences, both internally and externally, taking into account culture, sexuality, and gender to be evaluated with a given rubric within the CMS.

Method

Other

Integration

Laboratory practicals will be given to evaluate the student's competency in identifying anatomical structures within the nervous, cardiovascular, endocrine, immune, and urinary systems and also correlating them with their physiology or function.

DE Adaptations for MOE

In a DE adaptation lab practicals will be given at the end of each lab module utilizing the quiz feature within the accessible CMS environment.

Method

Oral Presentation

Integration

Oral presentations are evaluated based on the content of presentation, clarity, and completeness, as well as proper research of the anatomical and physiological concepts of the nervous, cardiovascular, endocrine, immune, or urinary system while evaluating the differences in culture, sexuality, and gender.

DE Adaptations for MOE

Oral presentations will be assigned and submitted through the course management system (CMS) to facilitate distance education. Evaluation of these oral presentations will include an assessment of students' content of presentation, clarity, and completeness, as well as proper research of the anatomical and physiological concepts. Additionally, students may be required to present their findings through various mediums, such as slide presentations, written reports, or accessible live video conferences. With student consent, these presentations may be shared with the entire class through the CMS. The instructor will rigorously maintain adherence to accessibility standards throughout all stages of the oral presentation assignment. The oral presentation will undergo feedback and grading within two weeks after submission via the CMS. Feedback will be provided through comments posted directly on the assignment or an accompanying rubric for clarity.

Method

Self-Evaluation

Integration

Throughout the course, students will be given the opportunity to examine their own understanding of the material on the nervous, cardiovascular, endocrine, immune, and urinary systems through self-reflection activities.

DE Adaptations for MOE

The opportunity for self-evaluations can be done regularly as an assignment and/or survey in the CMS. The self-reflections will be assigned and submitted through the course management system (CMS) to facilitate distance education. Evaluation of these self-reflections will be based on full completion of the survey or fully answering the reflection questions. The instructor will rigorously maintain adherence to accessibility standards throughout all stages of the self-reflection assignment. The self-reflection will undergo feedback and grading within two weeks after submission via the CMS. Feedback will be provided through comments posted directly on the assignment or an accompanying rubric for clarity.

Assignments

Assignment Type

Reading

In-class and/or outside of class

In-class

Outside of class

Formative or Summative

Formative

Assignment

Case Study in Mini-Movement

Read the following articles. (This will help you figure out what is wrong with Kenny!)

1. Czaplinski, A., A.J. Steck, P.M. Andersen, and M. Weber. (2004). Flail arm syndrome: a clinical variant of amyotrophic lateral sclerosis. *European Journal of Neurology* 11(8), 567.
2. Kelly, T.W. 1975. Prolonged cerebellar dysfunction associated with paint-sniffing. *Pediatrics* 56(4):605–606.
3. Hoogduin, K., C. Verdellen, & D. Cath. 1997. Exposure and Response Prevention in the Treatment of Gilles de la Tourette's Syndrome: Four Case Studies. *Clinical Psychology & Psychotherapy* 4(2), 125–135.

Once you have done so, read about Kenny's case and answer the questions that follow.

Kenny is a seemingly normal teenager, except for one thing: he experiences uncontrollable bodily and facial movements. At a young age, he started having “fits” of facial grimacing, frequent blinking, and lip puckering. By the third grade, these were accompanied by various vocalizations; he would growl, snort, and grunt at odd times, or hum tunelessly for up to an hour. This was distracting both to his teacher and his class mates, and fairly distressing for both Kenny and his parents.

Kenny exhibited other odd behaviors. He would spin himself around and around (beginning slowly and then increasing in speed) until he was so dizzy he couldn't stand. Often, he could not sit still for very long; at unexpected times he would throw himself out of his chair or off a bench for no apparent reason. He also had overriding compulsions to touch objects, including parts of his own body, over and over again. Along with these impulses, Kenny also continuously wrung and washed his hands. As he aged, he learned to resist these desires for a brief period of time, but often he just couldn't help himself. Oddly enough, these desires seemed to increase whenever he was under stress, which, unfortunately, was frequently.

Not only did Kenny like to spin himself, he also was strangely attracted to spinning things. On more than one occasion he had run straight into a revolving door as he was trying to dodge in and out of it. He was musically talented, and was known in his high school jazz band for his strangely (and wildly) creative improvisations on the drums.

Much to Kenny's and his parents' relief, the movements, including the spinning, began to decrease in both severity and frequency when he entered adolescence. He would still jerk occasionally and shout at unexpected times, but things had improved. However, his compulsions to touch items and wash his hands remained unchecked.

At several points during his childhood, Kenny's doctors tried various pharmacological interventions. Clonidine, haldol, and pimozide had all been tried with varying success, but had side effects that worried both Kenny's parents and his doctors. Buspirone seemed to help with the hand wringing and hand washing, but not with the twitches and vocalizations. His doctors had also tried exposure therapy, which seemed to be the most effective in further reducing at least some of his strange movements.

Questions:

1. What condition or conditions (there may be more than one possibility) are being described in this case? Does this involve brain damage, a specific disease or disorder, or some other condition that may be affecting the patient's ability to move?
2. What brain area or area(s) may be involved? How should they function normally? What could be causing this dysfunction?

3. How would the treatments recommended affect the brain? How might those effects relate to the symptoms?
4. How can you explain all of the symptoms exhibited by this case? Can you relate each symptom to a specific brain area or neurotransmitter?
5. What other interventions may be possible, besides those noted here?

Feel free to look up more scientific articles to help you figure out what is wrong with Kenny. You will be scored on the accuracy of your answers and the quality of your sources. Even if your answer is not exactly what I was looking for, if you can back up your answers with evidence, you will still receive partial credit.

How assignment will be adapted in online format

This assignment will be administered, submitted, and assessed entirely through the course management system (CMS) to accommodate online learning. All course materials, including assignment instructions, supplementary resources, website links, etc., will be accessible to students via the CMS. Students will submit their assignments through the CMS, and instructors will provide feedback within two weeks of submission. Feedback will be delivered through the grade book function, messaging, or other confidential communication channels within the CMS. All course materials and communications will adhere to accessibility guidelines to ensure inclusivity for all students.

Assignment Type

Other

In-class and/or outside of class

In-class

Formative or Summative

Formative

Assignment

This lab will introduce you to the external and internal anatomy of the sheep heart. The sheep heart is very similar to the human heart and thus works as a useful model. In this lab you will be using the CAROLINA Placemats as a reference.

The most superficial outside layer of the heart is the pericardium. The pericardium is a type of serous membrane secreting a slippery fluid around the outside of the heart. The pericardium has two layers called the parietal pericardium and the visceral pericardium. The parietal pericardium is a sac-like membrane enclosing the heart while the layer directly attached to the outside of the heart is the visceral pericardium. Depending on our supplier, your heart may or may not have the parietal pericardium.

An important landmark for the anatomy and dissection of the heart is the coronary sulcus. The coronary sulcus is a small depression of fat that circumscribes the superior one-third of the heart. Make a small shallow incision at a right angle to the sulcus and partially fold the incision open to examine the small blood vessel within the fatty tissue. This blood vessel is the coronary sinus which drains blood from the heart muscle back to the vena cava. Above the coronary sulcus is the atria located on the right and left sides. Note that the exterior of the atria has a scalloped edge at its distal border. This is called the auricle and allows the atria a greater surface area for expansion and filling with blood.

Which of the two atria appear larger on the exterior surface?

Below the sulcus are the right and left ventricles. To determine the right and left sides of the heart, examine the tip of the heart. The tip is called the apex of the heart and is the most inferior portion of the heart which comes to a blunt point. The apex contains only the left ventricle and not the right side. Look for the right ventricle and note that it appears to be stuck onto the side of the left ventricle.

The relatively squared off portion of the heart on the superior border is called the base. The base is the exit point for all of the major blood vessels. It is next to impossible to identify the blood vessels without seeing the organs that are connected to the heart. Another complication is that many of the organ supplier's crop vessels off too close. For example the vena cava may only be observed and not the superior or inferior vena cava.

Interior Anatomy Note: do not use a scalpel as depicted on the diagram in the CAROLINA placements. In class there are several butcher knives. One of these should be used for the initial cut. Using a scalpel is dangerous and leads to a rough cut.

It is difficult to find the correct orientation to cut the heart open. Check with your instructor prior to cutting to make sure you are cutting in the proper orientation. A rule of thumb is to try and not cut exactly through the septum area dividing the right and left chambers called the interatrial and interventricular septums. If you were unfortunate enough to cut this orientation you would see

only a septal walls. Avoid this by locating again the apex and the left side of the heart. The right and left coronary arteries run directly superficial to the interventricular septum. Start the cut at the apex at a point that divides the right and left coronary arteries equally in half with the base resting on the dissection pan. Cut the heart into two nearly equal halves using the large butcher knife. Be careful not to cut yourself and always keep your fingers away from the direction of the knife. Examine the interior anatomy and identify the structures listed below. Use your textbook and the figures on the next page as a reference.

1. Aorta
2. Aortic valve
3. Apex
4. Auricle (not appendage)
5. Bicuspid valve
7. Chordae tendinae
8. Coronary sulcus
9. Inferior vena cava
11. Interventricular sulcus
12. Left atrium
13. Left ventricle
14. Papillary muscles
15. Pulmonary artery
16. Pulmonary trunk
17. Pulmonary veins
18. Right atrium
19. Right ventricle
20. Superior vena cava
21. Trabeculae carneae
22. Tricuspid valve

Additional items not listed on the placement

Parietal Pericardium
Visceral Pericardium
Endocardium
Myocardium
Fossa ovalis
Coronary sinus
Coronary sulcus

Look at the atria and ventricles but this time from the interior. Note the wall thickness of the atria and ventricles. Compare the wall thickness and sizes of the right and left ventricles. The walls of the ventricles are composed of myocardium containing the cardiac muscle.

Review the chapter on muscle tissue and state four differences between skeletal and cardiac muscle.

Which side has the greatest myocardium thickness?

The very interior of the heart chambers is lined with a membrane called the endocardium. The extension of the endocardium forms the valves of the heart. In the right side of the heart between the atria and ventricle is the tricuspid valve while the bicuspid valve is between the atria and ventricle on the left side. Note that the valves have cord-like structures attached which are called chordae tendineae. These cords keep the valves in the proper orientation and keep blood from regurgitating back into the atria during ventricle contraction. The chordae tendineae attach to the endocardial layer by a cluster of muscles called the papillary muscles. These muscles contract during stretch and act to absorb some of the shock to the cords during ventricular contraction. Also within the endocardium are folds of heart tissue called trabeculae carneae. The trabeculae carneae is similar in function to the auricle in allowing for stretch and increasing surface area but in addition aid in the electrical conduction of the depolarization during contraction.

Do the trabeculae folds exist in the atria?

Locate the septum between the two atria. Look for a small depression on the interatrial septum. This depression is called the fossa ovalis. This fossa is the remnant of the foramen ovalis during fetal circulation.

State the function of foramen ovalis during fetal circulation.

One relatively difficult task is the identification of the blood vessels attached to the heart. Many of the blood vessels on the sheep heart have been cut short. In order to identify these blood vessels it will be important to examine what side the blood vessel is attached to and whether or not the vessel is entering or leaving the heart. To determine whether or not a vessel is coming or going from the heart you need to slice open each vessel and look to see if it contains a semilunar valve. The semilunar valves are located within the vessels at a point proximal to the attachment of the heart.

First locate the aorta and pulmonary artery and then by a process of elimination locate the remaining vessels. The aorta is one of the largest blood vessels and is connected to the left side of the heart. In the interior wall of the aorta is a semilunar valve which is at or near its attachment to the left ventricle on the base of the heart. The semilunar valves are three pocket-shaped flaps. If you cannot locate the semilunar valve use a probe to follow the vessel's path. Be careful not to push too hard with the probe as you can poke through the heart. Take a look at the direction of the flaps to see if the flow of blood to collapse the valves is toward or away from the heart.

Any blood vessel that directs blood away from the heart is an artery. This vessel carries oxygenated blood to the entire body. Directly superior to the semilunar valves are the openings to the right and left coronary arteries. These arteries serve the myocardium of the heart itself. The other major blood vessels connected to the left side are the right and left pulmonary veins. These veins carry oxygenated blood from the lungs and there will be no valves in these blood vessels.

Check out the right side of the heart. Cut open the vessels connected to this side and look for a semilunar valve. If it has a valve it would be the pulmonary semilunar valve. The blood flow is identical to the aorta which is away from the heart and supplies the lungs with deoxygenated blood. The remaining blood vessels connected to the right side lacking semilunar valves and are the superior and inferior vena cava. These two vessels bring blood from the body to start the entire cycle of blood flow over again.

Note: When finished be sure to wipe off the placemats with soapy water and dry with a paper towel. Put the heart into a plastic lined bucket. Clean the dissection tools and dissection trays. Make sure to clean out the sink and put the tray in the sink so that it will drain properly.

The quality of your dissection will be graded and expect to be quizzed on the heart anatomy next week using the list provided above.

How assignment will be adapted in online format

This assignment will be done in person due to the hands-on dissection of the heart. This course has to be Hybrid as fully online is not accepted for transfer for nursing and other programs.

Assignment Type

Writing

In-class and/or outside of class

Outside of class

Formative or Summative

Summative

Assignment

The Intersection of Diversity, Equity, and Inclusion in Managing Cardiovascular, Endocrine, or Immunological Disorders

Objective:

This assignment aims to enhance your understanding of how diversity, equity, and inclusion (DEI) influence the prevention, management, and treatment of chronic health conditions. By exploring social determinants of health, disparities in access to care, and culturally competent healthcare practices, students will gain a holistic view of how health equity can improve outcomes for individuals with cardiovascular, endocrine, or immunological disorders.

Instructions:

Write a comprehensive essay of 1,200–1,500 words addressing the following prompt. Use at least 5 academic sources, personal insights, and case examples to support your analysis. Properly cite all references using APA format. At least 3 academic resources need to be sourced using the MSJC Library database.

Prompt

Choose one chronic condition: cardiovascular disorders (e.g., heart disease, hypertension), endocrine disorders (e.g., diabetes, thyroid dysfunction), or immunological disorders (e.g., lupus, multiple sclerosis). Your essay should address the following components:

Diversity in Health Impact:

Analyze how this condition disproportionately affects specific populations based on factors such as race, ethnicity, gender, socioeconomic status, and geographic location.

Highlight the role of genetics, lifestyle, and environmental influences in contributing to disparities.

Health Equity and Barriers to Care:

Discuss barriers to equitable healthcare access for patients with the chosen condition, including financial, systemic, and cultural challenges.

Explore how inequities in healthcare delivery impact outcomes and quality of life.

Consider how certain technological advantages help to improve equitable outcomes.

Brainstorm at least one public health strategy that can help decrease barriers to care in your local community.

The Role of Inclusion and Cultural Competence:

Find one online chat group, blog or support group that provides a sense of inclusion for the patients suffering from your chosen disorder.

You will be graded on the quality of your sources and following the given guidelines: 5 sources (3 from the MSJC Library data bases), fully addressing each of the topics as described in the instructions (Diversity in Health Impact, Health Equity and Barriers to Care, Health Equity and Barriers to Care).

How assignment will be adapted in online format

Students can use library databases remotely, and research can be conducted online. This assignment will be administered, submitted, and assessed entirely through the course management system (CMS) to accommodate online learning. All course materials, including assignment instructions, supplementary resources, website links, etc., will be accessible to students via the CMS. Students will submit their assignments through the CMS, and instructors will provide feedback within two weeks of submission. Feedback will be delivered through the CMS's grade book function, messaging, or other confidential communication channels. All course materials and communications will adhere to accessibility guidelines to ensure inclusivity for all students.

Course Materials

Textbooks

Tortora, Gerald J. and Derrickson Bryan (2021). Principles of Anatomy and Physiology, 16th ed. John Wiley and Sons, Inc. ISBN: 978-1119492030

Saladin, Kenneth S. (2023) Anatomy & Physiology: The Unity of Form and Function, 10th ed. McGraw Hill ISBN: 978-1265328627

Other Resources

Martin, T. & Prentice-Craver, C.. Laboratory Manual for Human Anatomy & Physiology Main Version. (2018) 4th ed McGraw Hill ISBN: 978-1259864612

Open Educational Resources

Betts, Gordon J. (2024) Anatomy and Physiology 2e. Open Stax ISBN: 978-1998428908

Class Size Information

Class Size

32

Class Size Category

G - Large lab 32

Diversity and Inclusion

Course Design and Materials: Course will incorporate diverse perspectives, authors, and examples that reflect a variety of cultures, identities, and lived experiences. Instructional materials will be reviewed regularly to ensure representation, inclusivity, and alignment with equity-minded practices across disciplines.

Inclusive Learning Environment: Instructors will establish classroom norms and policies that promote respect, civil discourse, and belonging in both online and face-to-face classes. Clear expectations for communication and engagement will support a learning space where all students feel valued and heard.

Accessible Instruction: Course content will be delivered using accessible design. Materials will follow accessibility guidelines within the CMS, including captioned media, readable document formats, and multiple means of engagement to support diverse learning.

Equitable Teaching Practices: Instructors will use transparent and grading criteria, varied assessment methods, and timely feedback to promote fairness and student success. Opportunities for revision, reflection, and multiple demonstrations of learning may be incorporated when appropriate to the discipline.

Culturally Responsive Pedagogies: Instructional strategies will encourage critical thinking about diverse perspectives and systems of power relevant to the course content. Faculty will foster opportunities for students to connect course material to real-world contexts.

Ongoing Reflection and Improvement: Faculty will engage in continuous professional development related to IDEAA principles and reflect on course practices using metacognition to identify opportunities for increased equity, inclusion, and accessibility.

Explain how diversity and inclusion(e.g., gender, culture/race, sexuality, etc.) is infused into the course.

Diversity and inclusion are integral to this course, given the wide range of disease states in the nervous, endocrine, cardiovascular, immune, and urinary systems that individuals may encounter throughout their lives. Students will explore how people from different backgrounds experience health and illness in these systems, recognizing that certain risk factors may disproportionately affect specific groups. Through this course students will also explore inclusive environments where patients can connect, sharing common experiences and fostering a sense of community.

Describe how assignments, instruction, evaluation, course content, and interactions are contextualized for diverse learners promoting an equitable course.

The course content has been updated to include a wider range of anatomically accurate images and illustrations that are more diverse and inclusive, particularly in the endocrine, urinary, and nervous systems. Our methods of instruction and evaluation, incorporate case studies and oral presentations addressing cultural, racial, gender, and sexuality differences. Open Educational Resources (OER) have also been made available to assist students facing financial hardships. The lab designs ensure that students can actively engage with the instructor and each other.

Interactions

Explain how the course will incorporate student-to-student interaction.

In-person labs will be used to foster student engagement as students will collaborate in groups within the laboratory setting to complete hands-on tasks and experiments addressing the nervous, endocrine, cardiovascular, lymphatic, respiratory, and urinary systems, as well as fluid and electrolyte homeostasis. Students will work together on case studies focused on pathologies related to the nervous, endocrine, cardiovascular, lymphatic, respiratory, and urinary systems. This collaborative approach will bring together students from diverse backgrounds—spanning political, social, ethnic, and socioeconomic contexts—allowing them to explore and deepen their understanding of Anatomy and Physiology collectively.

Explain how the course will incorporate instructor-to-student interaction.

The instructor will facilitate lectures, discussions, and lab sessions designed to engage students in exploring various aspects of Anatomy and Physiology, including the Integumentary, Skeletal, Muscular, Digestive, and Reproductive Systems. Throughout the course, students will actively participate in investigations of the nervous, endocrine, cardiovascular, lymphatic, respiratory, and urinary systems. The instructor will provide timely, constructive feedback and assign grades in class and through the Course Management System (CMS), ensuring students receive ongoing support and guidance.

Explain how the course will incorporate student-to-content interaction.

Students will engage with Anatomy and Physiology content through a combination of lectures, textbook readings, case studies, oral presentations, and hands-on lab activities. The course will provide opportunities for students to actively engage with the material and explore diverse presentations of diseases in the nervous, endocrine, cardiovascular, lymphatic, respiratory, and urinary systems, considering how race and culture may influence the biological presentation of selected pathologies. Students' understanding of biology and cultural factors in health will be enhanced. This provides a comprehensive view of human physiology and disease in the nervous, endocrine, cardiovascular, lymphatic, respiratory, and urinary systems.

Explain how the course will incorporate student-to-self interaction (metacognitive).

This Anatomy and Physiology course emphasizes critical thinking and encourages students to reflect not only on the content they are learning but also on the learning process itself and how it relates to their personal experiences with the nervous, endocrine, cardiovascular, lymphatic, respiratory, and urinary systems in the human body. Students will engage in a variety of activities, including discussions, collaborative lectures, lab exercises, and reflective writing. These activities will inspire students to explore areas of uncertainty within the medical field, while also providing opportunities for self-reflection on their own learning journey and understanding of the material.