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# ANAT-101: HUMAN ANATOMY & PHYSIOLOGY I

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**Effective Term**

Fall 2026

**BOT Approval Date**

05/15/2025

**Discipline**

ANAT - Anatomy & Physiology

**Course Number**

101

**Course Title**

Human Anatomy & Physiology I

**Short Title**

Human Anatomy & Physiology I

**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**

The face-to-face meetings will involve many hands-on lab activities, such as using a microscope, viewing cadavers, analyzing various sugars and proteins and how their differences in structure can produce varying chemical reactions, viewing bone and muscle models, and examining slides.

**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 is the first in a two part series covering the topics of the chemical, cellular, and tissue levels of organization. In addition this course provides a systematic study of the anatomy and physiology of the following systems: integumentary, reproductive, skeletal, muscular, digestive and metabolic.

**Requisites****Recommended Preparation****Recommended Preparation (note that students can enroll in the class even if they haven't take the recommended course)**

BIOL-100 or BIOL-C1000 or BIOL-150 or CHEM-100 or CHEM-101 or CHEM-107.

**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

**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. Classify anatomical terminology in the identification and description of human body.                                                                                                                            |
| 2. Analyze the principles of chemistry as it relates the elemental, molecular, cellular, organ, and organismal level.                                                                                              |
| 3. Relate cellular structure with the function of the cell and assess the interactions of cellular organelles to homeostasis.                                                                                      |
| 4. Differentiate tissues by histological features and relate how their structure correlates to their function.                                                                                                     |
| 5. Correlate the detailed anatomy of the integumentary, skeletal, muscular, digestive and reproductive structures to their physiology.                                                                             |
| 6. Analyze the homeostatic regulation for the integumentary, skeletal, muscular, digestive and reproductive systems.                                                                                               |
| 7. Predict the cause and effect relationships with selected pathologies of the integumentary, skeletal, muscular, digestive and reproductive systems taking into account race and culture in selected pathologies. |

**Learning Outcome Information****Course Learning Outcomes**

| Learning Outcome                                                                                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Students will identify the anatomy and analyze the physiology of the integument including the various epidermal derivatives.                                                       |
| 2. Students will integrate anatomy to the physiology of muscle contraction including the events within neuromuscular junctions.                                                       |
| 3. Students will investigate the anatomy and physiology of the digestive system including homeostatic mechanisms of digestion and absorption for carbohydrates, proteins, and lipids. |

**Content****Course Lecture Content**

- I. Introduction to the human body
  - A. Characteristics of life
  - B. Homeostasis
  - C. Basic anatomical terminology
- II. The chemical level of organization
  - A. Matter, atoms, and electronic configurations
  - B. Chemical bonds
    - 1. Ionic bonds

2. Covalent bonds

3. Hydrogen bonds

III. Chemical reactions

A. Activation energy

B. Enzymes

C. Types of reactions

IV. Inorganic compounds and solutions

A. Acids

B. Bases

C. Buffers

D. Salts

V. Organic compounds

A. Carbon properties

B. Carbohydrates

C. Lipids

D. Proteins

E. Nucleic acids and ATP

VI. Cellular level of organization

A. Plasma membrane

B. Transport mechanisms

1. Passive transport (Diffusion and Filtration)

a. Diffusion

b. Facilitated diffusion

c. Osmosis

2. Active transport

a. Primary transport

b. Secondary transport

c. Phagocytosis/endocytosis, etc.

C. Organelles

1. Centrosome, flagella, cilia

2. Ribosomes

3. Endoplasmic reticulum

4. Golgi apparatus

5. Lysosomes

6. Peroxisomes

7. Mitochondria

D. Protein synthesis

E. Mitosis

F. Homeostatic mechanisms

G. Selected pathologies

VII. Tissue level of organization

A. Epithelium

B. Connective

C. Muscular

D. Nervous

E. Membranes

F. Homeostatic mechanisms

G. Selected Pathologies

VIII. The integumentary system

- A. Epidermis, its layers and derivatives
  - B. Dermis
  - C. Accessory structures
    - 1. Hair and nails
    - 2. Glands
      - a. Sudoriferous
      - b. Sebaceous
      - c. Cerumen
  - D. Skin physiology
  - E. Homeostatic mechanisms
  - F. Selected pathologies and their differences across races and cultures.
- IX. The skeletal system
- A. Bone histology
  - B. Bone ossification
  - C. Axial anatomy and physiology
  - D. Appendicular anatomy and physiology
  - E. Homeostatic mechanisms
  - F. Selected pathologies and their differences across races and cultures.
- X. Joints
- A. Classification based on tissue, movement, shape
  - B. Cartilage joints
  - C. Fibrous joints
  - D. Synovial joints
  - E. Selected pathologies and their differences across races and cultures.
- XI. Muscular system
- A. Types of muscles
    - 1. Smooth
    - 2. Cardiac
    - 3. Skeletal
  - B. Skeletal muscle contraction
  - C. Muscle metabolism
  - D. Muscle control
  - E. Selected pathologies and their differences across races and cultures.
- XII. Digestive system
- A. Layers of the digestive system
  - B. Anatomy and physiology of the organs of the digestive system
    - 1. Mouth
    - 2. Esophagus
    - 3. Stomach
    - 4. Liver
    - 5. Pancreas
    - 6. Small intestines
    - 7. Large intestines
  - C. Enzymes, products, and secretion of digestive enzymes
  - D. The breakdown and transport and utilization of lipids
  - E. Homeostasis of the digestive system
  - F. Selected pathologies and their differences across races and cultures.
- XIII. Metabolism
- A. Oxidation-Reduction

- B. Carbohydrate metabolism
- C. Protein metabolism
- D. Lipid metabolism
- E. Nutrition
- F. Homeostatic mechanisms
- G. Selected pathologies and their differences across races and cultures.

#### XIV. Reproductive System

- A. Meiosis
- B. Male anatomy and physiology
  - 1. Scrotum
  - 2. Testes
  - 3. Ducts
  - 4. Accessory glands
- C. Female anatomy and physiology
  - 1. Ovaries
  - 2. Uterine tubes
  - 3. Uterus
  - 4. Vagina
  - 5. Vulva
  - 6. Mammary glands
  - 7. Reproductive cycle
- D. Homeostatic mechanisms
- E. Selected pathologies and their differences across races and cultures.

#### XV. Development and inheritance

- A. Development
  - 1. Fertilization
  - 2. Embryonic development
  - 3. Fetal development
  - 4. Labor and birth
  - 5. Homeostatic mechanisms
  - 6. Selected pathologies and their differences across races and cultures.
- B. Inheritance
  - 1. Phenotype and genotype
  - 2. Dominant, recessive, and co-dominant
  - 3. Autosomal and sex chromosomes
  - 4. Sex-linkage
  - 5. Epigenic expression
  - 6. Selected pathologies

#### Course Lab Content

##### Representative Lab Content

- I. Introduction to Anatomy & Physiology
  - A. Cadaver organ anatomy and physiology
  - B. Torso study and body regions
- II. Measurement
  - A. US standard
  - B. Metric system
  - C. Conversions
- III. Medical terminology
- IV. Microscope theory and use

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**V. Cellular Level of Organization**

- A. Diffusion in a semisolid
- B. Diffusion in a liquid
- C. Osmosis across an artificial membrane
- D. Osmosis across a living membrane
- E. Mitotic analysis with an onion root tip and whitefish blastula

**VI. Tissue Level of Organization**

- A. Epithelial tissues
- B. Connective tissues
- C. Nervous tissues
- D. Muscular tissues

**VII. The Integumentary System**

- A. Burn Assessment

**VIII. The Skeletal System**

- A. Chicken bone treatments
- B. Appendicular system anatomy
- C. Axial system anatomy

**IX. The Muscular System**

- A. Rabbit muscle contraction
- B. TENS lab
- C. Cadaver and Torso examinations

**X. The Digestive System**

- A. Digestion of carbohydrates
- B. Enzymes

**XI. The reproductive system**

- A. The male reproductive system
- B. The female reproductive system

**XII. Development and Inheritance**

- A. Starfish embryology
- B. Frog embryology
- C. Chicken embryology
- D. Human embryology

**E. Inheritance (monohybrid, dihybrid, sex-linkage, and human traits)****Methods of Instruction****Method**

Directed Study

**Integration**

Case studies will analyze select physiological pathologies, such as skin diseases, bone repair, muscle conditions, and digestive diseases. 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**

Each case study will be presented as an assignment in the CMS system, with students reading about a particular patient and answering questions utilizing online lectures, online textbook, and relevant websites. All content will be accessible through the CMS.

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**Method**

Experiments

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**Integration**

In the lab, students will complete a large assortment of "wet" laboratory experiments that demonstrate various physiological activities such as osmosis, diffusion, digestion, and development.

**DE Adaptations for MOI**

The lab will take place face-to-face in the classroom (lab). This is a Hybrid course where the lab is fully in-person due to transfer requirements.

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**Method**

Lab Activities

**Integration**

Students will use musculature models, skeletons, organ models, and the cadaver to study various anatomical structures. Microscopes will also be used to study human histology.

**DE Adaptations for MOI**

The lab will take place face-to-face in the classroom (lab). This is a Hybrid course where the lab is fully in-person due to transfer requirements.

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**Method**

Lecture

**Integration**

Lecture and Interactive discussions that apply to anatomy, physiology, homeostasis, and pathology will be used to teach students concepts in chemistry, cell biology, the integumentary system, the skeletal system, the muscular system, the digestive system, metabolic processes, and the reproductive systems taking into account race and culture in selected pathologies.

**DE Adaptations for MOI**

Lectures will be recorded and uploaded to view within the CMS system. These lectures will utilize accessible video, audio, or slide presentation formats and will be posted on the CMS platform for distance education.

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**Method**

Group Projects

**Integration**

Students will participate in cooperative learning activities that pose critical thinking questions related to homeostasis and selected pathologies in the integumentary, skeletal, muscle, digestive, and reproductive systems. They will work together to answer the critical thinking questions posed by the instructor.

**DE Adaptations for MOI**

These will take place in the face-to-face lab. This is a Hybrid course where the lab is fully in-person due to transfer requirements.

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**Method**

Film/video Viewing and Discussion

**Integration**

Students will view videos of various physiological concepts (chemical bonding, osmosis, diffusion, skin healing, bone growth and repair, muscular physiology, digestive physiology, metabolic processes, digestive physiology, and reproductive physiology). After viewing the videos students will answer questions about the physiological processes.

**DE Adaptations for MOI**

The videos can be viewed online, and the questions will be provided as an assignment in the CMS. For the distance education (DE) adaptation of the course, accessible video scenarios will be incorporated into the curriculum. Because the student cannot be



present in the classroom special efforts will be made to ensure the distant learner has a similar experience as those students in the classroom. Students will watch these scenarios and take detailed notes on the content presented. They will answer questions on each physiological process as an assignment in the CMS system. All methods used for this adaptation will meet accessibility standards.

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## Methods of Evaluation

### Method

Papers

### Integration

Case studies will be presented and will be followed by a report that applies concepts of anatomy and physiology in order to predict outcomes and treatments appropriate for selected pathologies-based medical practices in the integumentary, skeletal, muscular, digestive, and/or reproductive systems relating to the selected pathologies to cultural and gender differences when relevant.

### DE Adaptations for MOE

In the online format case studies will be administered, graded, and assessed entirely through the course management system (CMS). Students will be assessed on their ability to identify, understand, and apply major topics outlined in the course content in relation to the conditions of each patient in the case study. The case studies will align closely with the specified learning objectives.

To ensure fairness and accessibility for all students, students can present their conclusions in a written or oral video format within the CMS. This diverse format provides an equitable opportunity for students to demonstrate their understanding and mastery of the material.

Adherence to accessibility standards will be rigorously maintained by the instructor throughout all stages of the project. Upon submission via the CMS, research projects will undergo feedback and grading within two weeks. Feedback will be provided either through comments posted directly on the assignment or accompanied by an accompanying rubric for clarity.

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### Method

Quizzes

### Integration

Following each lecture (anatomy and physiology, chemistry, cell biology, histology, integumentary system, skeletal system, muscular system, digestive system, metabolism, and the reproductive system), there will be a quiz on the material presented. The quizzes will include a variety of question types, including true or false, multiple choice, fill-in-the-blanks, and short answer questions.

### DE Adaptations for MOE

Online quizzes will be administered, graded, and assessed entirely through the course management system (CMS). These assessments will focus on students' ability to identify, understand, and apply major topics outlined in the course content, aligning closely with the specified learning objectives.

Upon completion, quizzes will be submitted to the online grading system within the CMS. They will be evaluated based on accuracy and completeness, and students can expect to receive feedback within two weeks. This feedback will be provided through the grade book, chat function, or other accessible conferencing tools, facilitating ongoing support and engagement with course content.

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### Method

Other

### Integration

Laboratory practicals will be given to determine competence in laboratory methods as well as the memorization of particular anatomical features in histology, bone anatomy, and muscle anatomy.

### DE Adaptations for MOE

Lab practicals will take place face-to-face in the classroom (lab). This is a Hybrid course where the lab is fully in-person due to transfer requirements.

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**Method**

Class Work

**Integration**

During each lab, laboratory worksheets will be completed demonstrating the application of relevant physiological processes in chemistry, cell biology, histology, bone physiology, muscle physiology, digestive physiology, metabolic processes, and reproductive physiology. The worksheets will provide the opportunity to integrate the material presented in the lecture as applied to laboratory settings.

**DE Adaptations for MOE**

Labs will take place face-to-face in the classroom (lab). This is a Hybrid course where the lab is fully in-person due to transfer requirements.

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**Method**

Exams/Tests

**Integration**

Tests and quizzes are used to determine the student's understanding and grasp of the course content. Tests and quizzes may be multiple choice, written, oral, essay, or hands on identification of models or dissected materials.

**DE Adaptations for MOE**

This could be given as an assignment within the CMS. The CMS will allow accessibility for students with the option of screen readers, High contrast UI, underlined links, and alt text on images. The report will be graded within 2 weeks and feedback will be provided through the grade book, chat function, or other accessible conferencing tools, facilitating ongoing support and engagement with course content.

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**Assignments****Assignment Type**

Writing

**In-class and/or outside of class**

In-class

Outside of class

**Formative or Summative**

Formative

**Assignment**

A Tale of Two Olympic Leg Breaks  
(TRUE STORIES!)

**Purpose:** The purpose of this assignment is to compare and contrast two different types of breaks and the implications of each type of break. The microscopic structure of the bone will also be analyzed and how it functions to keep our bones strong will be thought through. As a result of completing this assignment, you will be able to predict the outcome of different bone breaks and have a better understanding of microscopic bone anatomy and physiology and how they relate to real world bone health.

**Task:**

- Read through each of the histories and answer the questions at the end.
- While reading through each of the histories, take note of the type of break in each and think through the implications of each break.
- Start thinking about lateral and compressive stresses and how bones are structured to deal with these.
- Our bones are made of different tissues than our joints and thus heal differently. Think of reasons why this would be.

**Criteria:** The grade on the assignment will reflect on how completely and correctly you answer the questions.

**Example:**

**Question-**When our two Olympic athletes work out, they not only make their muscles stronger, but they also make their bones stronger and denser. What two cells are involved in this bone building and how do they work?

**Excellent Answer-**When stress is put on bones, osteocytes send out signals that the bones need to get better to support the stress the body is experiencing. They signal osteoblasts to come and put down more collagen and calcium to make a stronger and denser bone.

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## Bad Answer-Bones get stronger and denser

History 1: In 2012 Manteo Mitchell felt the pop in his leg and knew it wasn't good. "It felt like somebody literally just snapped my leg in half," he said.

The American sprinter had half a lap to go in the first leg of the 4x400-meter relay preliminaries and a choice to make: keep running or stop and lose the race. He finished the lap and limped to the side to watch the Americans finish the race and qualify easily for the final. A few hours later, doctors confirmed what he suspected: He had run the last 200 meters with a broken left fibula.

"I heard it and I felt it," Mitchell told The Associated Press. "But I figured it's what almost any person would've done in that situation." Mitchell finished his heat in a more-than-respectable 46.1 seconds, and the United States tied the Bahamas in the second heat in 2 minutes, 58.87 seconds - the fastest time ever run in the first round of the relay at the Olympics.

The 25-year-old sprinter from Cullowhee, N.C., said he was diagnosed with a complete break of the left fibula - but it was not a compound fracture and the bone is expected to heal on its own in four to six weeks.

"I pretty much figured it was broken, because every step I took, it got more painful," he said. "But I was out there already. I just wanted to finish and do what I was called in to do."

History 2: American skier Nina O'Brien said she was 'giving it everything [she] had' - and 'maybe too much' - when she suffered a compound fracture to her left leg in a grisly crash on the second run of the women's giant slalom race at the Beijing Winter Olympics in 2022. O'Brien, 24, collided with the penultimate gate and crashed over the line, lying in a crumpled heap in the finish area. An X-ray revealed that the fracture was a compound, tibial-fibular fracture just below the knee. The X-ray also revealed a torn meniscal cartilage in the knee above the fracture. She remained in the hospital for two weeks because of an infection of the leg in the area of skin breakage. Her immobilized leg was casted after the infection subsided. O'Brien had been told the healing process might take anywhere from six months to two years. She spent five weeks on crutches and another eight weeks wearing a boot. The bones ultimately healed in those 8 weeks, but her meniscus and it took 8 MONTHS for her to ski again.

### Questions:

1. What does the term "tibial-fibular fracture" mean?
2. What is a compound fracture?
3. Which athlete was more likely to become infected than a routine fracture of the leg and why?
4. Describe the microscopic features of osseous tissue that help long bones withstand lateral stress without breaking.
5. Describe the microscopic features of the osseous tissue that help long bones withstand compressive forces without breaking.
6. What features of the knee joint structure help minimize friction between the thigh bone and the leg bone? What features of the joint keep the thigh, tibia, and fibula bones aligned?
7. Describe the changes a broken bone undergoes as it is healing. (What steps are involved in this process?)
8. Which athlete would heal faster and why?
9. How does weight-bearing influence the bone repair process you described above? (i.e. what effect does weight-bearing have on the orientation of the Haversian systems?)
10. Why did Nina's bones heal faster than her meniscus?
11. What is a "broad-spectrum" antibiotic, and why did she need it? Is healthy skin normally colonized by bacteria?
12. Why was skin-grafting necessary in this patient? (Why not just let the skin heal on its own?)
14. Why did the patient lose so much weight despite being on a very high-calorie diet?
15. What long-term problems may the patient have as a result of extensive scar tissue formation over her trunk and her right elbow?

### How assignment will be adapted in online format

This could be given as an assignment within the CMS. The CMS will allow accessibility for students with the option of screen readers, High contrast UI, underlined links, and alt text on images. The report will be graded within 2 weeks and feedback will be provided through the grade book, chat function, or other accessible conferencing tools, facilitating ongoing support and engagement with course content.

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### Assignment Type

Reading

### In-class and/or outside of class

In-class

Outside of class

### Formative or Summative

Summative

## Assignment

We have covered the following systems this semester: Integumentary, Skeletal, Muscular, Digestive, and Reproductive Systems. For each of the systems, find scholarly articles in PubMed that describe a condition or pathology that could present differently in patients depending on their race and/or cultural background. Read the articles carefully. Show the differences in pictures or data you found from reliable scholarly sources. Explain the differences between different races and/or cultures.

(This is an example of an appropriate scholarly article from PubMed.)

Smith JH, Silverberg JI. Correlation of clinician-reported outcomes with patient-reported outcomes by race and ethnicity in patients with atopic dermatitis. *J Am Acad Dermatol.* 2023 Sep;89(3):579-580. doi: 10.1016/j.jaad.2023.04.050. Epub 2023 May 4. PMID: 37148972.)

Your report should be 2-3 pages or a 5-minute presentation. You will be graded on the quality of your sources, the accuracy of the information, and the explanation of the differences.

## How assignment will be adapted in online format

To ensure fairness and accessibility for all students, students can submit their report in a written or oral video format within the CMS. This diverse format provides an equitable opportunity for students to demonstrate their understanding and mastery of the material. Upon submission via the CMS, this assignment will undergo feedback and grading within two weeks. Feedback will be provided either through comments posted directly on the assignment or accompanied by an accompanying rubric for clarity.

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## Assignment Type

Other

## In-class and/or outside of class

In-class

## Formative or Summative

Formative

## Assignment

Reproductive System

The objectives of this lab are to learn the microscopic anatomy of the male and female gonads. In addition, and where supplies are available, you will dissect the reproductive tract of a male and female organism or examine models on display. In each case you will get to appreciate the histological changes that occur as the sex cells develop.

## The Testis

The first gonad to examine is the male gonad or testicle. The testicle is unique in that as the cells mature they are shed from the basement membrane of the seminiferous tubules to the interior lumen. A lumen is defined as the open cavity of a tube. The initial cell of sperm production is the spermatogonium. This cell undergoes mitosis to form the primary spermatocyte. The mitosis in this area is prolific to increase the number of sperm to the millions. From here the cell undergoes meiosis I to form the secondary spermatocyte and then meiosis II to form the spermatid. On each of these divisions the sex cell is pushed further towards the lumen. The spermatid matures by condensing its cytoplasm and forming a flagellum.

State the function of the flagellum.

Are there any other cells in the human that contain a flagellum?

Between the tubules are where the Leydig cells (endocrinocytes) are located. What is the function of Leydig cells?

Draw a single section of a seminiferous tubule labeling spermatogonium, Sertoli cells, sperm, Leydig cells, basement membrane and lumen.

How does the size of the spermatogonium compare to the sperm cell?

Count how many cells on average there are in a single line from the basement membrane to the lumen?

On average, how many Leydig cells form an individual cluster? Count three clusters and take the average.

As you recall from above, the endocrinocytes cells produce testosterone.

List at least five functions of testosterone.

### The Ovary

The ovary is very different in anatomy and physiology when compared to the testicle. One of the most obvious differences is the dramatic reduction of sex cells. The ovary instead of having millions of sex cells only has several thousand immature cells and typically only one mature cell at the time of ovulation in humans. Your specimen may have a few mature sex cells especially if it is a cat or mouse slide.

Why is there a reduction in the number of sex cells in females in comparison to males?

Also note the ovary is not a series of hollow tubes but instead a solid organ. For this portion of the lab you will be required to draw the various stages listed. Where indicated, state the ploidy of the cell(s). Ploidy is the number of chromosome sets. Ploidy in the ovary is either diploid, meaning 2 sets of chromosomes, or haploid meaning one set. Diploid sets are present prior to the event of meiosis I.

Look at the Ovary slide under a microscope. Find and draw each of the stages.

1. Primordial Cells

Where in the ovary are primordial cells located? (Towards the outside, middle, interior portion of the ovary)

2. Primary Follicle

3. Secondary Follicle

4. Mature or Graafian Follicle

5. Corpus Luteum

What is the function of the Corpus luteum?

Examine the reproductive models to locate and identify the following parts.

Glans penis

Prostate gland

Bulbourethral glands

Urinary bladder

Testes

Spermatic cord

Spongy urethra

Membranous urethra

Prostatic urethra

Seminal Vesicles

Uterus

Myometrium

Endometrium

Ovary

Vagina

Uterine tube

Fimbriae

Cervix

Labia minora

Labia majora

### How assignment will be adapted in online format

Labs will be taught face-to-face. This is a Hybrid course where the lab is fully in-person due to transfer requirements.

## 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 individuals may encounter throughout their lives. Students will explore how people from different backgrounds experience health and illness, recognizing that certain risk factors—such as race and gender—may disproportionately affect specific groups. Through the study of selected pathologies, students will also examine the role of biomedical technology in treating diseases and disorders, focusing on how advancements have enabled patients to manage these conditions with less disability. Additionally, the course provides students with the opportunity to consider equitable solutions for individuals facing these challenges. Students will also explore inclusive environments where patients can connect with one another, 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.**

We have emphasized increased reflection on the learning process to support diverse learners, particularly those new to academia and from underrepresented groups. This approach encourages deeper engagement and personal growth. The course content has been updated to include a wider range of anatomically accurate images and illustrations that are more diverse and inclusive, especially in the integumentary and reproductive systems. We have also diversified our methods of instruction and evaluation, incorporating more than just lectures and exams to promote engagement, community building, and greater support for all students.

Open Educational Resources (OER) have also been made available to assist students facing financial hardships. The lab portion of the course ensures students can actively engage with the instructor and each other. This creates a collaborative community of practice where students develop critical thinking skills, practice new concepts in and outside of class, and receive feedback both informally (through discussions and lab activities) and formally (via formative and summative assessments submitted through the CMS).

## Interactions

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

Discussion boards in the CMS system will be used to foster student engagement on various Anatomy and Physiology topics, including selected pathologies. In the face-to-face modality, students will collaborate in groups within the laboratory setting to complete hands-on tasks and experiments. Additionally, students will work together on case studies focused on pathologies related to the integumentary, skeletal, muscular, digestive, and reproductive systems. This collaborative approach will bring together students from diverse backgrounds—spanning political, social, ethnic, and socioeconomic contexts—providing them with the opportunity to collectively explore and deepen their understanding of Anatomy and Physiology.

### **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 these systems. The instructor will provide timely, constructive feedback and assign grades both 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, and hands-on lab activities. The course will provide opportunities for students to actively engage with the material and explore diverse presentations of diseases, considering how race and culture may influence the biological presentation of selected pathologies. This approach will enhance students' understanding of the intersection between biology and cultural factors in health, preparing them for a more comprehensive view of human physiology and disease.

### **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 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.