

**ITT Technical Institute**  
**GE259**  
**Anatomy and Physiology II**  
**Onsite Course**

**SYLLABUS**

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**Credit hours:** 4

**Contact/Instructional hours:** 50 (30 Theory Hours, 20 Lab Hours)

**Prerequisite(s) and/or Corequisite(s):**

Prerequisites: GE258 Human Anatomy and Physiology I

**Course Description:**

This course is a continuation of the study of the anatomy and physiology of the human body. Building on the foundation of structural organization, basic chemistry, and the study of cells and tissues, and study of integumentary, skeletal, muscular, nervous, sense, and endocrine systems, this course focuses on the maintenance of the body via the cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems, as well as metabolism, acid-base balance, fluid and electrolyte balance, and nutrition.

This course includes a wet laboratory component.

## Where Does This Course Belong?

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Human Anatomy and Physiology I and II are part of the General Education Science curriculum.

### Program Information

#### Program Scope and Core Content Areas

General Studies courses are interdisciplinary courses that support both core and general education courses.

General Education courses include courses in the humanities, composition, mathematics, the sciences, and the social sciences.

#### Program Goals and Objectives

General Education courses are designed to provide ITT Tech students with a well-rounded education in the context of their technical programs. Each course emphasizes one or more of ITT Tech's General Education Student Learning Outcomes.

1. Demonstrate personal responsibility.
2. Analyze information.
3. Solve complex problems.
4. Communicate effectively in oral, written and visual forms.
5. Contribute as a member of a team.
6. Pursue lifelong learning opportunities.

#### Career Impact

General Education courses provide breadth to a core technical program. Courses in General Education are intended to broaden a student's educational experience, and therefore, broaden his/her perspective.

**NOTE:** Refer to the catalog for the state-specific course and program information, if applicable.

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## Course Summary

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### Major Instructional Areas

1. The cardiovascular system
2. The lymphatic system
3. The immune system
4. The respiratory system
5. The digestive system
6. The urinary system
7. Fluid and acid-base balance
8. The reproductive system
9. Growth and development

### Course Objectives

1. Describe the distribution, regulation, and protection functions of blood.
2. Examine the structure, function, and common disorders affecting the cardiovascular system.
3. Examine the structure, function, and common disorders affecting the lymphatic system.
4. Examine the structure, function, and common disorders affecting the immune system.
5. Examine the structure, function, and common disorders affecting the respiratory system.
6. Examine the structure, function, and common disorders affecting the digestive system.
7. Examine the structure, function, and common disorders affecting the urinary system.
8. Explain how the body's fluids help maintain homeostasis in the body.
9. Examine the structure, function, and common disorders affecting the reproductive system.
10. Describe the events of embryonic development from zygote to parturition.
11. Describe the role genetics and heredity play in anatomy and physiology.
12. Describe the interactions between each of the organ systems in the human body.
13. Demonstrate knowledge and laboratory skills required for dissection.
14. Use the ITT Tech Virtual library and other ITT Tech resources to research various topics as appropriate.

### Detailed Topical Outline

1. Blood Composition
  - 1.1. Blood Composition, Erythrocytes, Leukocytes, and Platelets
    - 1.1.1. Blood
  - 1.2. Blood and Bleeding Disorders
    - 1.2.1. Tell Me About Blood

### 1.3. ABO Blood Typing

#### 1.3.1. Components of Blood: Identification of RBCs, WBCs, and Platelets and Blood Typing

## 2. Heart and Blood Vessels

### 2.1. Gross Anatomy of the Heart

#### 2.1.1. Cardiac, Conduction, Cycle, and Output

### 2.2. Blood Vessels

#### 2.2.1. Blood Vessels

#### 2.2.2. Blood Vessel Identification

#### 2.2.3. Sheep Heart Dissection

#### 2.2.4. Blood Vessel Dissection

### 2.3. Age-Related Changes to the Heart

#### 2.3.1. Age-Related Changes that Occur in the Cardiovascular System

### 2.4. Effect of Exercise on the Heart

#### 2.4.1. Heart Rate Calculations

### 2.5. Physiology of the Heart

#### 2.5.1. The Heart Structure and Functions

## 3. The Lymphatic System

### 3.1. Lymphatic Vessels

#### 3.1.1. Organs of the Lymphatic System

#### 3.1.2. Disorders and Diseases Affecting the Lymphatic System

### 3.2. Lymphatic Tissues

#### 3.2.1. Lymphatic System

## 4. The Immune System

### 4.1. Innate Versus Adaptive Immunity

#### 4.1.1. The Immune System

### 4.2. Hypersensitivity

#### 4.2.1. Hypersensitivity

### 4.3. Ouchterlony Test

#### 4.3.1. Ouchterlony Test

### 4.4. Immune System Disorders

#### 4.4.1. Disorders Affecting the Immune System

## 5. The Respiratory System

### 5.1. Functional Anatomy of the Respiratory System

#### 5.1.1. Functional Anatomy of the Respiratory System

#### 5.1.2. Respiratory System Structure and Function

### 5.2. Mechanisms of Breathing

#### 5.2.1. Mechanisms of Breathing

- 5.2.2. Pulmonary Ventilation
- 5.3. Gas Exchange
  - 5.3.1. Gas Exchange
- 5.4. Disease and Conditions Associated with the Respiratory System
  - 5.4.1. Case Study: Cari's Story
- 6. The Digestive System
  - 6.1. Functional Anatomy of the Digestive System
    - 6.1.1. Structure and Function of the Gastrointestinal Tract
  - 6.2. Digestive Processes
    - 6.2.1. Chemical Digestion and Absorption
  - 6.3. Nutrition: Vitamins, Minerals, and Water
    - 6.3.1. Nutrition and Metabolism
  - 6.4. Diseases and Conditions Associated with the Digestive System
    - 6.4.1. Case Study: Zachary's Story
    - 6.4.2. Age-Related Changes and Diseases Affecting the Digestive System
- 7. The Urinary System
  - 7.1. Functional Anatomy of the Urinary System
    - 7.1.1. Gross and Microscopic Anatomy and Function of the Urinary System
    - 7.1.2. Urinary System Structure and Function
  - 7.2. Urine Composition and Formation
    - 7.2.1. Urine Formation
    - 7.2.2. Urine Formation and Urinalysis
  - 7.3. Regulation of Urine Concentration and Volume
    - 7.3.1. Urinary System Homeostasis
    - 7.3.2. Case Study: Sam's Story
- 8. Fluid and Acid-Base Balance
  - 8.1. Body Fluids and Composition
    - 8.1.1. Buffer Systems: The First Responders
    - 8.1.2. The Respiratory System and Body Homeostasis
  - 8.2. Water Balance, Electrolyte Balance, and Acid-Base Balance
    - 8.2.1. Kidneys and Acid-Base Balance
    - 8.2.2. Kidneys and Fluid Balance
    - 8.2.3. Case Studies: The Case of the Man with the Swollen Kidneys and The Case of the Thirsty Woman
    - 8.2.4. Carbon Dioxide and pH
    - 8.2.5. Mechanisms of Blood pH Balance
- 9. The Reproductive System

9.1. Functional Anatomy of the Male and Female Reproductive Systems

9.1.1. Functional Male Anatomy

9.1.2. Functional Female Anatomy

9.1.3. Male Reproductive System Structure and Function

9.1.4. Female Reproductive System Structure and Function

9.1.5. Using Your Knowledge

9.2. Physiology Female Reproductive Cycle

9.2.1. The Female Reproductive Cycle

9.3. Diseases and Conditions Affecting the Reproductive Systems

9.3.1. Sexually Transmitted Infections Game

10. Human Development

10.1. Fertilization and Embryonic Development

10.1.1. Fertilization and Development Overview

10.1.2. Fertilization and Development

10.1.3. Using Your Knowledge

10.2. Parturition and Lactation

10.2.1. Labor and Lactation

## Learning Materials and References

### Required Resources

Complete Textbook Package	New to this Course	Carried over from Previous Course(s)	Required for Subsequent Course(s)
Jenkins, G., Kemnitz, C., and Tortora, G. (2013). <i>Anatomy and physiology: From science to life</i> (3 <sup>rd</sup> ed.). Hoboken, NJ: John Wiley & Sons, Inc.			
Allen, C. and Harper, V. (2014). <i>Laboratory manual for anatomy and physiology</i> (5 <sup>th</sup> ed.). Hoboken, NJ: John Wiley& Sons, Inc.			
Allen, C., Harper, V., Lancraft, T, and Ivlev, Y. (2007). PowerPhys 3.0 [Online Resource Access Code located in laboratory manual for anatomy and physiology]. Hoboken, NJ: John Wiley& Sons, Inc.			
Allen, C. and Harper, V. (2014). <i>Fetal pig dissection: A laboratory guide</i> (3 <sup>rd</sup> ed.). Hoboken, NJ: John Wiley & Sons, Inc.			
<i>Real Anatomy 2.0</i> [Web Product-code included in text package]. 2012. Nielson, M. and Miller, S. Hoboken, NJ: John Wiley& Sons, Inc.			
LabPaq customized lab kit for ITT			

### Recommended Resources

#### Professional Associations

- Human Anatomy and Physiology Society (HAPS)  
<http://www.hapsweb.org/>  
 Various articles, exams, safety manuals, etc. on anatomy and physiology can be found at this site, established for students and private companies.
- American Association of Anatomists (AAA)  
<http://www.anatomy.org/>  
 Via research, education, and professional development activities, AAA focuses on anatomical form and function.
- American Physiological Society (APS)  
<http://the-aps.org/>  
 APS is a nonprofit society devoted to fostering education, scientific research, and dissemination of information in the physiological sciences.

ITT Tech Virtual Library (accessed via Student Portal)

- Layman, D. (2004). *Physiology demystified*. New York: McGraw-Hill Professional.
- Leonard, R. (1995). *Human gross anatomy: An outline text*. New York: Oxford University Press.
- Montgomery, R. & Gilland, K. (2003). *Appleton & lange review of anatomy* (6<sup>th</sup> ed.). New York: McGraw-Hill Professional.

Other References▪ Wiley Portal:▪ Wiley Media Site

There are many media elements included in this course, including interactivities, animations, and videos. In addition, there are activity sheets that go along with these animations. You can access all of the links to the media and the blank activity sheets on a specific web site set up for ITT Technical Institute at: <http://mywiley.info/ITTAP2STUD> Click on the book. Then, click on Student Resources. Choose the Unit. Accept the Agreement, enter the password, and log in. Choose the Unit one more time. Click on the media element or activity sheet to begin.

Password: ittstud

▪ Wiley Student Companion Site

Wiley offers a Student Companion Site for the course's required text. Log on to:

<http://bcs.wiley.com/he-bcs/Books?action=index&itemId=0470598913&bcsId=6942>

**Or** you can log on to [www.wiley.com](http://www.wiley.com), then type the text isbn (0470598913) in the search bar on the upper right hand side of the web page and click the search button. You will then be taken to a screen with the text cover image and title listed. Click on the "Visit the Companion Sites" link under the text title and then click on the "Student Companion Site" link from the drop down menu.

▪ Wiley offers a Student Companion Site for the course's required lab manual. Log on to:

<http://www.wiley.com/WileyCDA/WileyTitle/productCd-EHEP002940.html>

▪ Cadaver Dissections Videos

<http://www.lawrencegaltman.com/Naugbio/CADAVER/GALLERY.htm>

Video footage from the University of Wisconsin Medical College cadaver dissections for the study of Anatomy



- The Visible Human Project®  
[http://www.nlm.nih.gov/research/visible/visible\\_human.html](http://www.nlm.nih.gov/research/visible/visible_human.html)  
Complete, anatomically detailed, three-dimensional models of the normal male and female human bodies produced from cadaver sections
- University of Minnesota Web Anatomy  
<http://msjensen.cehd.umn.edu/webanatomy/>  
Collection of study aids for anatomy and physiology
- Loyola University Medical Education Network—Master Muscle List  
<http://www.meddean.luc.edu/lumen/MedEd/GrossAnatomy/dissector/mml/index.htm>  
A quick reference for information on the origin, insertion, nerve supply, and action of any given muscle in the body

- University of Delaware—Histology

<http://www.udel.edu/biology/Wags/histopage/histopage.htm>

Collections of color and low-magnification histology images, cell and tissue ultrastructure images, and 3D models.

- Loyola University Medical Education Network (LUMEN)

[http://www.lumen.luc.edu/lumen/meded/Histo/frames/histo\\_frames.html](http://www.lumen.luc.edu/lumen/meded/Histo/frames/histo_frames.html)

Collection of histology slides that can be used for study and review

**NOTE:** All links are subject to change without prior notice.

## Information Search

Use the following keywords to search for additional online resources that may be used for supporting your work on the course assignments:

- Blood Composition
- Circulatory System
- Lymphatic System
- Immune System
- Respiratory System
- Urinary System
- Acid-Base Balance
- Reproduction
- Reproductive System
- Human Development

## Suggested Learning Approach

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In this course, you will be studying individually and within a group of your peers. As you work on the course deliverables, you are encouraged to share ideas with your peers and instructor, work collaboratively on projects and team assignments, raise critical questions, and provide constructive feedback.

Use the following advice to receive maximum learning benefits from your participation in this course:

DO	DON'T
<ul style="list-style-type: none"> <li>▪ Do take a proactive learning approach</li> <li>▪ Do share your thoughts on critical issues and potential problem solutions</li> <li>▪ Do plan your course work in advance</li> <li>▪ Do explore a variety of learning resources in addition to the textbook</li> <li>▪ Do offer relevant examples from your experience</li> <li>▪ Do make an effort to understand different points of view</li> <li>▪ Do connect concepts explored in this course to real-life professional situations and your own experiences</li> </ul>	<ul style="list-style-type: none"> <li>▪ Don't assume there is only one correct answer to a question</li> <li>▪ Don't be afraid to share your perspective on the issues analyzed in the course</li> <li>▪ Don't be negative about the points of view that are different from yours</li> <li>▪ Don't underestimate the impact of collaboration on your learning</li> <li>▪ Don't limit your course experience to reading the textbook</li> <li>▪ Don't postpone your work on the course deliverables – work on small assignment components every day</li> </ul>

### Instructional Methods

The curriculum is designed to encourage a variety of teaching strategies that support the course objectives while fostering higher cognitive skills. This course will employ multiple methods to deliver content and inspire and engage you, including lectures, collaborative learning options, and hands-on activities. This course is composed of Theory and Lab components. Your progress will be regularly assessed through Case Studies, Assignments, Exercises, Labs, and a Final Exam.

### Out-of-Class Work

For purposes of defining an academic credit hour for Title IV funding purposes, ITT Technical Institute considers a quarter credit hour to be the equivalent of: (a) at least 10 clock hours of classroom activities and at least 20 clock hours of outside preparation; (b) at least 20 clock hours of laboratory activities; or (c) at least 30 clock hours of externship, practicum or clinical activities. ITT Technical Institute utilizes a “time-based option” for establishing out-of-class activities which would equate to two hours of out-of-class activities for every one hour of classroom time. The procedure for determining credit hours for Title IV

funding purposes is to divide the total number of classroom, laboratory, externship, practicum and clinical hours by the conversion ratios specified above. A clock hour is 50 minutes.

A credit hour is an artificial measurement of the amount of learning that can occur in a program course based on a specified amount of time spent on class activities and student preparation during the program course. In conformity with commonly accepted practice in higher education, ITT Technical Institute has institutionally established and determined that credit hours awarded for coursework in this program course (including out-of-class assignments and learning activities described in the "Course Outline" section of this syllabus) are in accordance with the time-based option for awarding academic credit described in the immediately preceding paragraph.

## Course Outline

<b>Unit 1: BLOOD COMPOSITION</b>				<b>Total outside work: 7 hours</b>
Upon completion of this unit, students are expected to:				
<ul style="list-style-type: none"> <li>▪ List the formed elements and describe the fluid portion of the blood.</li> <li>▪ Explain the process of hemopoieses.</li> <li>▪ Describe a mature red blood cell and the function of hemoglobin.</li> <li>▪ Recognize the metabolites of red blood cells and the location of phagocytes that destroy red blood cells after the 120 day life cycle.</li> <li>▪ Explain the process of erythropoiesis.</li> <li>▪ Differentiate between blood types based on the A and B surface antigens.</li> <li>▪ Identify the granular and agranular white blood cells, describing their roles in inflammation and infection.</li> <li>▪ Describe a platelet and its role in reducing blood loss.</li> <li>▪ Explain the process and role of hemostasis.</li> </ul>				
<b>READING ASSIGNMENT</b>	<b>Author</b>	<b>Chapter/Title</b>	<b>Pages (if necessary)</b>	<b>Total Pages</b>
	Jenkins	Chapter 18	pp. 614-641	28
<b>OUT-OF-CLASS WORK</b>	<b>Activity</b>			<b>Estimated Time</b>
	Complete the reading assignment			3 hrs
	Work on Unit 1 Case Study 1: Tell Me About Blood			2 hrs
	Work on Unit 1 Lab 1: Components of Blood			2 hrs

**Unit 2: HEART AND BLOOD VESSELS**

Upon completion of this unit, students are expected to:

- Describe the location of the heart in the mediastinum and the pericardial layers.
- Locate the four chambers of the heart, following blood flow through and into and out of the heart via the major blood vessels.
- Describe the function and operation of the heart valves.
- Differentiate between the pulmonary and systemic circuits associated with the right and left heart, respectively.
- Explain the cardiac conduction system that coordinates effective pumping of the heart.
- Explain the different phases of an electrocardiogram.
- Explain the phases of the cardiac cycle, including atrial and ventricular systole and diastole.
- Explain the effect of changes in heart rate and stroke volume on cardiac output.
- Describe the three tissue layers of most blood vessels.
- Differentiate between elastic arteries, muscular arteries, and arterioles
- Describe the structure and function of capillaries.
- Explain how venules and veins function and return blood to the heart.
- Explain how the roles of pressure and resistance to blood flow are interrelated.
- Explain how blood pressure is regulated by neural and hormonal feedback systems.
- Discuss blood and pulse pressures and their value to cardiovascular assessment.
- Differentiate between the pulmonary and systemic circulation.
- Identify the major systemic veins.

**Total  
outside  
work:**  
9 hours

READING ASSIGNMENT	Author	Chapter/Title	Pages (if necessary)	Total Pages
		Jenkins	Chapters 19-20	642-741
OUT-OF-CLASS WORK	Activity			Estimated Time
	Complete the reading assignment			4 hrs
	Work on Unit 2 Assignment 1: Cardiac Conduction, Cycle, and Output			1 hr
	Work on Unit 2 Case Study 1: Age-Related Changes that Occur in the Cardiovascular System			2 hrs
Work on Unit 2 Lab 1: The Heart Structure and Function			2 hrs	
GRADED ACTIVITIES / DELIVERABLES	Grading Category	Activity/Deliverable Title	Grade Allocation (% of all graded work)	
	Case Study	Unit 1 Case Study 1: Tell Me About Blood (Assigned in Unit 1)	2.5%	
	Lab	Unit 1 Lab 1: Components of Blood Assigned in Unit 1)	2.5%	

<b>Unit 3: THE LYMPHATIC SYSTEM</b>				<b>Total outside work:</b> 5 hours
Upon completion of this unit, students are expected to:				
<ul style="list-style-type: none"> <li>▪ Describe lymph and how the lymphatic system functions.</li> <li>▪ Trace the flow of lymph from the tissue site to its return to circulating blood.</li> <li>▪ Describe the thymus, lymph nodes, spleen, and lymphatic follicles.</li> </ul>				
READING ASSIGNMENT	Author	Chapter/Title	Pages (if necessary)	Total Pages
	Jenkins	Chapter 21	pp. 742-752	11
OUT-OF-CLASS WORK	Activity			Estimated Time
	Complete the reading assignment			1 hr
	Work on Unit 3 Assignment 1: Disorders and Diseases Affecting the Lymphatic System			2 hrs
	Work on Unit 3 Lab 1: Lymphatic System			2 hrs
GRADED ACTIVITIES / DELIVERABLES	Grading Category	Activity/Deliverable Title		Grade Allocation (% of all graded work)
	Assignment	Unit 2 Assignment 1: Cardiac Conduction, Cycle, and Output (Assigned in Unit 2)		2.5%
	Case Study	Unit 2 Case Study 1: Age-Related Changes that Occur in the Cardiovascular System (Assigned in Unit 2)		2.5%
	Lab	Unit 2 Lab 1: The Heart Structure and Function (Assigned in Unit 2)		2.5%

<b>Unit 4: THE IMMUNE SYSTEM</b>				<b>Total outside work:</b> 6 hours
Upon completion of this unit, students are expected to:				
<ul style="list-style-type: none"> <li>▪ Differentiate between the components of innate immunity: external barriers, and internal defenses.</li> <li>▪ Explain how the complement system destroys microbes through phagocytosis, cytolysis, and inflammation.</li> <li>▪ Define adaptive immunity and the role of T and B lymphocytes produced in response to an antigen.</li> <li>▪ Explain the process of cell-mediated immunity involving cytokines and cytotoxic T cells.</li> <li>▪ Describe an antibody and how it functions in antibody-mediated immunity.</li> <li>▪ Differentiate between a primary and secondary immune response to an antigen and the value of memory cells.</li> </ul>				
READING ASSIGNMENT	Author	Chapter/Title	Pages (if necessary)	Total Pages
	Jenkins	Chapter 21	pp. 753-775	23
OUT-OF-CLASS WORK	Activity			Estimated Time
	Complete the reading assignment			2 hrs
	Work on Unit 4 Assignment 1: Hypersensitivity			2 hrs
	Work on Unit 4 Assignment 2: Disorders Affecting the Immune System			2 hrs
GRADED ACTIVITIES /	Grading	Activity/Deliverable Title		Grade

<b>DELIVERABLES</b>	<b>Category</b>		<b>Allocation</b> (% of all graded work)	
	Assignment	Unit 3 Assignment 1: Disorders and Diseases Affecting the Lymphatic System (Assigned in Unit 3)	2.5%	
	Lab	Unit 3 Lab 1: Lymphatic System (Assigned in Unit 3)	2.5%	
<p><b>Unit 5: THE RESPIRATORY SYSTEM</b></p> <p>Upon completion of this unit, students are expected to:</p> <ul style="list-style-type: none"> <li>▪ Trace the pathway of air in the upper respiratory system, noting the key structures of the nasal cavities and pharynx.</li> <li>▪ Trace the pathway of air in the lower respiratory system, describing the different cell types of the lung alveoli.</li> <li>▪ Use Boyle’s Law as a guide to explain the pressure and volume changes that skeletal muscles cause producing inhalation and exhalation.</li> <li>▪ Identify the lung volumes and capacities that are used to determine an individual’s respiratory status.</li> <li>▪ Use Dalton’s and Henry’s gas laws to explain the diffusion and diffusion gradients of oxygen and carbon dioxide at both the lungs and tissue.</li> <li>▪ Differentiate between internal and external respiration, including the factors that affect rate of diffusion.</li> <li>▪ Explain the roles of hemoglobin and plasma in carrying oxygen and carbon dioxide.</li> <li>▪ Identify the anatomical sites that control the basic rhythm of respiration.</li> <li>▪ Describe how the basic rhythm of respiration can be modified by thought and sensory receptors.</li> </ul>			<p><b>Total outside work:</b> 11 hours</p>	
<b>READING ASSIGNMENT</b>	<b>Author</b>	<b>Chapter/Title</b>	<b>Pages (if necessary)</b>	<b>Total Pages</b>
	Jenkins	Chapter 22	pp. 776-813	38
<b>OUT-OF-CLASS WORK</b>	<b>Activity</b>			<b>Estimated Time</b>
	Complete the reading assignment			3 hrs
	Work on Unit 5 Exercise 1: Gas Exchange			2 hrs
	Work on Unit 5 Case Study 1: Cari’s Story			2 hrs
	Work on Unit 5 Lab 1: Respiratory System Function and Structure			2 hrs
	Work on Unit 5 Lab 2: Pulmonary Ventilation			2 hrs
<b>GRADED ACTIVITIES / DELIVERABLES</b>	<b>Grading Category</b>	<b>Activity/Deliverable Title</b>		<b>Grade Allocation</b> (% of all graded work)
	Assignment	Unit 4 Assignment 1: Hypersensitivity (Assigned in Unit 4)		2.5%
		Unit 4 Assignment 2: Disorders Affecting the Immune System (Assigned in Unit 4)		2.5%

<b>Unit 6: THE DIGESTIVE SYSTEM</b>				<b>Total outside work:</b> 9 hours
Upon completion of this unit, students are expected to: <ul style="list-style-type: none"> <li>▪ Describe the multiple layers of the GI tract.</li> <li>▪ Describe the function of the mouth as the initial portion of the GI tract, identifying key anatomical features.</li> <li>▪ Differentiate between the voluntary and involuntary phases of swallowing, identifying the sites involved along the GI tract.</li> <li>▪ Describe the features associated with the stomach that allow for the mechanical and chemical digestion of the food bolus.</li> <li>▪ Explain the interrelationship of the pancreas, liver, and gall bladder.</li> <li>▪ Explain the specializations of the small intestine that function in chemical digestion and absorption and involve the liver and pancreas.</li> <li>▪ Describe the large intestine functions of secretion, absorption, and propulsion.</li> <li>▪ Explain the interplay of neural and hormonal regulation of the GI system during the three overlapping phases of digestion: cephalic, gastric, and intestinal.</li> <li>▪ Differentiate between the metabolic processes of catabolism and anabolism.</li> <li>▪ Explain why the human body needs vitamins, minerals, and water.</li> </ul>				
<b>READING ASSIGNMENT</b>	<b>Author</b>	<b>Chapter/Title</b>	<b>Pages (if necessary)</b>	<b>Total Pages</b>
	Jenkins	Chapter 23	pp. 822-883	61
<b>OUT-OF-CLASS WORK</b>	<b>Activity</b>			<b>Estimated Time</b>
	Complete the reading assignment			3 hrs
	Work on Unit 6 Case Study 1: Zachary's Story			2 hrs
	Work on Unit 6 Lab 1: Digestive System Structure and Function			2 hrs
	Work on Unit 6 Lab 2: Enzymes			2 hrs
<b>GRADED ACTIVITIES / DELIVERABLES</b>	<b>Grading Category</b>	<b>Activity/Deliverable Title</b>		<b>Grade Allocation (% of all graded work)</b>
	Exercise	Unit 5 Exercise 1: Gas Exchange (Assigned in Unit 5)		5%
	Case Study	Unit 5 Case Study 1: Cari's Story (Assigned in Unit 5)		2.5%
	Lab	Unit 5 Lab 1: Respiratory System Function and Structure (Assigned in Unit 5)		2.5%
		Unit 5 Lab 2: Pulmonary Ventilation (Assigned in Unit 5)		2.5%



<p><b>Unit 7: THE URINARY SYSTEM</b></p> <p>Upon completion of this unit, students are expected to:</p> <ul style="list-style-type: none"> <li>▪ Describe the functions of the kidneys.</li> <li>▪ Describe the structures of the kidney through which urine and blood flow.</li> <li>▪ Describe the components and functions of the nephron and collecting duct.</li> <li>▪ Distinguish among the locations and functions of glomerular filtration, tubular secretion, and tubular reabsorption.</li> <li>▪ Describe the filtration membrane and explain the process of glomerular filtration.</li> <li>▪ Distinguish between tubular reabsorption and tubular secretion and identify the locations where these processes occur.</li> <li>▪ Explain the hormonal regulation of tubular reabsorption and tubular secretion.</li> <li>▪ Describe the formation of dilute and concentrated urine.</li> <li>▪ Describe the structures and functions of the ureters, urinary bladder, and urethra.</li> </ul>				<p><b>Total outside work:</b> 7 hours</p>
<b>READING ASSIGNMENT</b>	<b>Author</b>	<b>Chapter/Title</b>	<b>Pages (if necessary)</b>	<b>Total Pages</b>
	Jenkins	Chapter 24	pp. 884-914, 918-925	39
<b>OUT-OF-CLASS WORK</b>	<b>Activity</b>			<b>Estimated Time</b>
	Complete the reading assignment			2 hrs
	Work on Unit 7 Assignment 1: Urinary System Homeostasis			2 hrs
	Work on Unit 7 Lab 1: Urinary System Structure and Function			1 hr
	Work on Unit 7 Lab 2: Urine Formation and Urinalysis			2 hrs
<b>GRADED ACTIVITIES / DELIVERABLES</b>	<b>Grading Category</b>	<b>Activity/Deliverable Title</b>		<b>Grade Allocation (% of all graded work)</b>
	Case Study	Unit 6 Case Study 1: Zachary's Story (Assigned in Unit 6)		2.5%
	Lab	Unit 6 Lab 1: Digestive System Structure and Function (Assigned in Unit 6)		2.5%
		Unit 6 Lab 2: Enzymes (Assigned in Unit 6)		2.5%

<b>Unit 8: FLUID AND ACID-BASE BALANCE</b>				<b>Total outside work: 5 hours</b>
Upon completion of this unit, students are expected to: <ul style="list-style-type: none"> <li>▪ Explain how the body regulates water intake and output.</li> <li>▪ Explain the role buffers play in maintaining the acid-base balance of the body.</li> <li>▪ Distinguish between acidosis and alkalosis.</li> <li>▪ Describe the role the respiratory system plays in controlling blood pH.</li> <li>▪ Explain how H<sup>+</sup> is excreted and HCO<sub>3</sub><sup>-</sup> ions are reabsorbed by the kidney.</li> <li>▪ Differentiate between the various conditions and diseases affecting fluid and acid-base balance.</li> </ul>				
READING ASSIGNMENT	Author	Chapter/Title	Pages (if necessary)	Total Pages
	Jenkins	various	pp. 39-42, 814-816, 914-918	12
OUT-OF-CLASS WORK	Activity			Estimated Time
	Complete the reading assignment			1 hr
	Work on Unit 8 Exercise 1: The Respiratory System and Body Homeostasis			2 hrs
	Work on Unit 8 Case Study 1: The Case of the Man with the Swollen Kidneys and The Case of the Thirsty Woman			2 hrs
GRADED ACTIVITIES / DELIVERABLES	Grading Category	Activity/Deliverable Title		Grade Allocation (% of all graded work)
	Assignment	Unit 7 Assignment 1: Urinary System Homeostasis (Assigned in Unit 7)		2.5%
	Lab	Unit 7 Lab 1: Urinary System Structure and Function (Assigned in Unit 7)		2.5%
		Unit 7 Lab 2: Urine Formation and Urinalysis (Assigned in Unit 7)		2.5%

<p><b>Unit 9: THE REPRODUCTIVE SYSTEM</b></p> <p>Upon completion of this unit, students are expected to:</p> <ul style="list-style-type: none"> <li>Identify the parts of the scrotum that support and help regulate the temperature of the testes.</li> <li>Trace the path of sperm as it leaves the testes and enters the duct system, explaining the role of fluids added by accessory sex glands.</li> <li>Describe the potential fates of a secondary oocyte.</li> <li>Describe the vagina and mammary glands and their role in childbirth and lactation.</li> <li>Differentiate between the ovarian and uterine portions of the female reproductive cycle.</li> </ul>				<p><b>Total outside work:</b> 8 hours</p>
READING ASSIGNMENT	Author	Chapter/Title	Pages (if necessary)	Total Pages
	Jenkins	Chapter 25	pp. 926-963	38
OUT-OF-CLASS WORK	Activity			Estimated Time
	Complete the reading assignment			2 hrs
	Work on Unit 9 Assignment 1: Sexually Transmitted Infections Game			2 hrs
	Work on Unit 9 Lab 1: Male Reproductive System Structure and Function			2 hrs
	Work on Unit 9 Lab 2: Female Reproductive System Structure and Function			2 hrs
GRADED ACTIVITIES / DELIVERABLES	Grading Category	Activity/Deliverable Title		Grade Allocation (% of all graded work)
	Exercise	Unit 8 Exercise 1: The Respiratory System and Body Homeostasis (Assigned in Unit 8)		5%
	Case Study	Unit 8 Case Study 1: The Case of the Man with the Swollen Kidneys and The Case of the Thirsty Woman (Assigned in Unit 8)		2.5%

<p><b>Unit 10: HUMAN DEVELOPMENT</b></p> <p>Upon completion of this unit, students are expected to:</p> <ul style="list-style-type: none"> <li>▪ Explain the processes the zygote undergoes between fertilization and implantation.</li> <li>▪ Explain the major phases of development of the embryo and fetus.</li> <li>▪ Discuss the changes of the uterus during pregnancy and the effects on nearby pelvic and abdominal structures.</li> <li>▪ Explain the three phases of maternal “labor.”</li> <li>▪ Discuss the hormonal interplay of prolactin, estrogens, progesterone, and oxytocin on lactation.</li> </ul>				<p><b>Total outside work:</b> 15 hours</p>
READING ASSIGNMENT	Author	Chapter/Title	Pages (if necessary)	Total Pages
	Jenkins	Chapter 25	pp. 964-987	24
OUT-OF-CLASS WORK	Activity			Estimated Time
	Complete the reading assignment			2 hrs
	Work on Unit 10 Exercise 1: Fertilization and Development			1 hr
	Work on Unit 10 Case Study 1: Lou and Susan’s Story			2 hrs
	Work on Unit 10 Lab 1: Using Your Knowledge			2 hrs
	Study for the Final Exam			8 hrs
GRADED ACTIVITIES / DELIVERABLES	Grading Category	Activity/Deliverable Title		Grade Allocation (% of all graded work)
	Assignment	Unit 9 Assignment 1: Sexually Transmitted Infections Game (Assigned in Unit 9)		2.5%
	Lab	Unit 9 Lab 1: Male Reproductive System Structure and Function (Assigned in Unit 9)		2.5%
		Unit 9 Lab 2: Female Reproductive System Structure and Function (Assigned in Unit 9)		2.5%

<b>Unit 11: COURSE REVIEW AND FINAL EXAMINATION</b>				<b>Total outside work: # hours</b>
Upon completion of this unit, students are expected to:				
<ul style="list-style-type: none"> <li>▪ Demonstrate an understanding of all course objectives.</li> </ul>				
<b>READING ASSIGNMENT</b>	<b>Author</b>	<b>Chapter/Title</b>	<b>Pages (if necessary)</b>	<b>Total Pages</b>
	Jenkins	Review all chapters		374
<b>GRADED ACTIVITIES / DELIVERABLES</b>	<b>Grading Category</b>	<b>Activity/Deliverable Title</b>		<b>Grade Allocation (% of all graded work)</b>
	Exercise	Unit 10 Exercise 1: Fertilization and Development (Assigned in Unit 10)		5%
	Case Study	Unit 10 Case Study 1: Lou and Susan's Story (Assigned in Unit 10)		2.5%
	Lab	Unit 10 Lab 1: Using Your Knowledge (Assigned in Unit 10)		2.5%
	Exam	Final Exam		25%

**Note:** Your instructor may add a few learning activities that are ungraded.

## Evaluation and Grading

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### Evaluation Criteria

The graded assignments will be evaluated using the following weighted categories:

Category	Weight
Assignment	15%
Case Study	15%
Exercise	15%
Lab	30%
Exam	25%
<b>TOTAL</b>	<b>100%</b>

### Grade Conversion

The final grades will be calculated from the percentages earned in the course, as follows:

Grade	Percentage
A (4.0)	90–100%
B+ (3.5)	85–89%
B (3.0)	80–84%
C+ (2.5)	75–79%
C (2.0)	70–74%
D+ (1.5)	65–69%
D (1.0)	60–64%
F (0.0)	<60%

## Academic Integrity

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All students must comply with the policies that regulate all forms of academic dishonesty or academic misconduct, including plagiarism, self-plagiarism, fabrication, deception, cheating, and sabotage. For more information on the academic honesty policies, refer to the Student Handbook and the Course Catalog.

*(End of Syllabus)*