

Kolbe Academy Home School

HIGH SCHOOL ANATOMY AND PHYSIOLOGY *Hole's Essentials of Human Anatomy & Physiology*

This is an Anatomy and Physiology course. The textbook contains pictures and descriptions that may not be suitable for all students particularly Chapters 19 & 20. Please be sure to review the course plan and textbook thoroughly before proceeding with the course. The textbook covers the material from a scientific and not a moral perspective. Kolbe Academy has included Church teaching to cover the moral perspective. We recommend this course for 12th Graders and more mature students who may be interested in the health sciences.

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COURSE TITLE: Anatomy and Physiology with Lab

COURSE TEXTS AND MATERIALS:

- ❖ *Hole's Essentials of Human Anatomy & Physiology* by Shier, Butler and Lewis, McGraw Hill (10th Edition), (T5350)
- ❖ McGraw Hill *Ph.I.L.S. Physiology Interactive Lab Simulations* CD-ROM, Optional (T5350C)
- ❖ Kolbe Academy Guide to Writing a Lab Report, Optional (T5140)

COURSE DESCRIPTION:

While the word "anatomy" is derived from the word for "dissection", this course will require little dissection. Instead, the student will study and benefit from the results of countless dissections that produced proper names and descriptions of the structures of the human body. Furthermore, the student will learn the function of these structures, properly known as the science of physiology and come to appreciate the complexity of God's creations.

This course does touch upon some ethical issues present in today's society, including birth control, fertility drugs and in vitro fertilization and genetic engineering. The Hole's textbook periodically features a "Topic of Interest" note that should be used as topics of discussion between the parent and student. Later in the year, the student will use one of these ethical issues and focus on the Church's teachings concerning it in a short paper. This course suggests supplemental materials that focus on the Church's teachings when indicated to help guide both parent and student during such discussions.

SCOPE AND SEQUENCE:

- | | |
|--|---|
| 1. Intro to Human Anatomy and Physiology | 11. Blood and the Cardiovascular System |
| 2. Chemical Basis of Life | 12. Lymphatic System and Immunity |
| 3. Cells and Cellular Metabolism | 13. Digestive System and Nutrition |
| 4. Tissues | 14. Respiratory System |
| 5. Integumentary System | 15. Urinary System |
| 6. Skeletal System | 16. Water, Electrolyte and Acid-Base Balance |
| 7. Muscular System | 17. Reproductive Systems |
| 8. Nervous System | 18. Pregnancy, Growth, Development and Genetics |
| 9. The Senses | |
| 10. Endocrine System | |

Supplemental and Optional Materials for Including Church Teaching:

Humani Generis, an Encyclical Letter of Pius XII (1950) (Available online for free)

Kolbe Academy Humani Generis Study Guide

Is Evolution Fit to Survive? Family Life Institute

Catechism of the Catholic Church

Humanae Vitae

Familiaris Consortis

Evangelium Vitae

Casti Connubii

Theology of the Body, Pope John Paul II

DIPLOMA REQUIREMENTS:

Summa Cum Laude diploma candidates using Anatomy and Physiology to fulfill their fourth year of science are required to pursue the Kolbe Core course (K) designation by following the course plan as laid out. **Magna Cum Laude** and **Standard** diploma candidates may choose to pursue the (K) designation, but are not required to do so, and instead have the option of altering the course plan as they choose. Anatomy and Physiology counts toward the biological science requirement for the Standard diplomas but does NOT count toward the Biology requirement for the Magna Cum Laude diploma. While lab credit is available for the Anatomy and Physiology course, for a student pursuing the **Magna Cum Laude** diploma, the science requirement dictates that lab work is incorporated into at least two of the following three courses: Biology, Chemistry or Physics. There is no lab requirement for the **Standard** diploma. Please see below for specific course titles, quarterly reporting requirements and transcript designations for Anatomy and Physiology.

REQUIRED SAMPLE WORK:

Designation*			K	K
Course Title	Anatomy and Physiology	Anatomy and Physiology with Lab	Anatomy and Physiology	Anatomy and Physiology with Lab
Quarter 1	1. Any written sample	1. Any written sample 2. Lab report	1. Completed Exam I	1. Completed Exam I 2. Lab report
Quarter 2	1. Any written sample	1. Any written sample 2. Lab report	1. Completed Exam II 2. Completed Exam III	1. Completed Exam II 2. Completed Exam III 3. Lab report
Quarter 3	1. Any written sample	1. Any written sample 2. Lab report	1. Completed Exam IV	1. Completed Exam IV 2. Lab report
Quarter 4	1. Any written sample	1. Any written sample 2. Lab report	1. Completed Exam V 2. Completed Exam VI	1. Completed Exam V 2. Completed Exam VI 3. Lab report

*Designation refers to designation type on transcript. K designates a Kolbe Academy Core course.

If the student wishes to have the course distinguished on the transcript with a (K) as a Kolbe Academy Core course, please be sure to send the correct exams and components each quarter for verification as specified above. **If no designation on the transcript is desired, parents may alter the lesson plan and any written sample work is acceptable to receive credit for the course each quarter.** If you have any questions regarding what is required for the (K) designation or diploma type status, please contact the academic advisory department at 707-255-6499 ext. 5 or by email at advisors@kolbe.org.

COURSE PLAN METHODOLOGY:

There are 6 tests incorporated into the course (3 per semester). These tests reflect the content of what was assigned in the weekly course plans. If students do the work assigned during the week, they should be adequately prepared for any question that arrives on the tests. The tests consist of many different types of questions including matching, multiple choice, short answers, essays and a practical or labeling exercise.

Lab work is incorporated throughout the course and combines the Ph.I.L.S CD-ROM, the ARIS website and other activities as well. Many anatomy and physiology courses would allow for exploring bones, diagrams, and models during a lab section called a "practical." As home schooled students, these can be hard to come by! Therefore, our practicals will consist of labeling illustrations and lab reports should be written to reflect Kolbe's *Guide to Writing a Lab Report*. To qualify the course as a lab science, students should spend an average of one hour per week doing some type of lab work. This may include field observation, dissection, visiting local museums or colleges, or using the Ph.I.L.S CD-ROM or ARIS website for activities. While this Ph.I.L.S CD-ROM incorporates some written lab analysis, the Kolbe student should keep in practice by writing a few lab reports. One lab report should be turned in with quarterly work to receive lab credit. A separate grade should NOT be given for the lab work, but should be incorporated into the grade given for the course.

The following key will help the parent and student understand how each week's assignments are laid out.

Reading: Includes pages from the specified chapter in the textbook (*Hole's Essentials of Human Anatomy and Physiology, 10th Edition*) or other specified outside reading.

Chapter Assessment and Integrative Assessment: Suggested questions from the *Anatomy and Physiology* text at the end of each chapter. The suggested questions will help the student prepare well for each test provided by Kolbe Academy. Answers to these questions are provided in the Kolbe Academy Answer Key to the *Anatomy and Physiology* text

ARIS Website: The following website provides free online activities and quizzes corresponding to the week's chapters: www.mhhe.com/shieress10. The "Practice test and Activities" offer interactive experiences to help the student identify problem areas in each chapter. They include the "Post-Test", "Essay Questions", "Labeling Exercises" and others. Also, each chapter offers "Animation Quizzes" that focus in on certain topics and present it in an interactive easy to understand way. **To access these activities, find the student registration code that came with your book. If you did not receive a registration code, use the following code instead: DDUU-WFQ3-9TTD-3R4H-GHQN.** Go to the above website and click on the website's link labeled "I am a Student." Using the code in your book, or the aforementioned code, set up an account and log in. Find the "Resources" tab and then click on the correct chapter number. A list of components will drop down. Click on the "Practice Test and Activities" link to access the online quizzes and activities. Other assigned work is found under the "Animation Quizzes" link. Bear in mind that the students will not always have covered the information in the online activities. **The material assigned on the ARIS website is meant to be supplemental in nature and is not absolutely necessary to do well on the exams.** However, it does provide additional assessment and demonstration of the concepts in the text. Finally, the student may find the "Study Tools" helpful though they are not assigned in the course plan. These include a "Study Outline" that could be printed out before reading the chapter and filled out as the student goes along. There are also links to textbook images and animations found here.

Lab Work (and Paper Topics): Suggested lab work is assigned from either the Ph.I.L.S CD-ROM, the ARIS website, paper topics or simple work that can be done at home and requires little or no equipment. Anatomy lab work involves exploring in-depth the structure of the human body, while physiology lab work should help the student understand the more complex ideas. The structure of the CD-ROM does allow the student to print a lab report, however the student should keep in good practice following Kolbe’s *Guide to Writing a Lab Report*. The paper topics will generally be given to the student in order for him to further pursue a topic in anatomy and physiology.

Key Terms: This is a list of important vocabulary terms to look out for as the student reads the chapter. These should be kept in mind as they will focus the student for the exams.

Important Concepts: The most important concepts for the student to understand are described in this section.

◆◆◆ FIRST QUARTER ◆◆◆

WEEK 1				
Reading	Chapter 1: Levels of Organization		Pages 1 – 19	
Chapter Assessment	Chapter 1 (pages 20 – 21)		# 2, 4, 5, 8, 10, 12, 14, 17, 18, 21, 22	
ARIS Website	Chapter 1		Practice Test and Activities: Post Test, Essay Questions	
Lab Work	ARIS Website Chapter 1		Labeling Exercises	
Key Terms	Anatomy	Set Point	Superior	Superficial
	Physiology	Effector	Inferior	Peripheral
	Cell	Axial	Medial	Deep
	Organelle	Appendicular	Lateral	Sagittal
	Tissue	Viscera	Proximal	Transverse
	Homeostasis	Parietal	Distal	Coronal
	Receptor	Anatomical Position		
Important Concepts	<p>This first chapter is a working introduction into some of the basic and most important terminology and organizational systems used in the study of anatomy and physiology. While understanding the body cavities is important, don't try and memorize all the organs involved in each body system just yet. Instead work towards obtaining a general understanding of the primary function of each system and the main organs that help it do that.</p> <p>The plates shown on pages 23 – 29 will be helpful later, but might be useful in gaining a deeper insight into the levels of organization of the human body you have just studied.</p>			
<div style="border: 1px solid black; padding: 2px; display: inline-block;">Notes</div>				

◆ COURSE PLAN ◆

WEEK 2				
Reading	Chapter 2: Chemical Basis of Life		Pages 30 - 48	
Chapter Assessment	Chapter 2 (page 49)		#'s 1 - 9, 13, 15 -21, 23, 25, 28, 29, 31 - 33	
Integrative Assessments	Chapter 2 (page 49)		#'s 3, 6, 7	
ARIS Website	Chapter 2		Practice Test and Activities: Post Test, Labeling Exercise	
Key Terms	Chemistry Matter Atom Nucleus Electron Proton	Neutron Ion Ionic Bond Covalent Bond Polar Hydrogen Bond	Molecule Compound Catalyst Enzyme Electrolyte	Acid Base pH Organic Inorganic
Important Concepts	While chemistry is not necessary when studying anatomy, it is an integral part of developing an understanding of the <i>physiology</i> of the human body. This science provides the groundwork for the rest of this semester foreshadowing our study of the muscular system (how our muscles contract to provide movement), the digestive system (how our bodies process and use what we eat) and also the nervous system (how our brain responds and reacts to external and internal stimuli).			
<div style="border: 1px solid black; padding: 2px; display: inline-block;">Notes</div>				
WEEK 3				
Reading	Chapter 3: Cells		Pages 50 - 66	
Chapter Assessment	Chapter 3 (pages 73 - 74)		# 1, 2, 4, 5, 6, 7, 9 - 14	
Integrative Assessments	Chapter 3 (page 74 - 75)		#'s 3, 6, 7	
ARIS Website	Chapter 3		Practice Test and Activities: Labeling Exercises 1 - 4 Animation Quizzes: "Lysosomes"; "Phagocytosis"	
Lab Work	Aris Website		Animation Quizzes: "How Diffusion Works"	
	Ph.I.L.S CD-ROM		Osmosis and Diffusion: "Varying Extracellular Concentration" Complete laboratory exercise, post lab quiz and print lab report.	
Key Terms	Cell Membrane Nucleus Cytoplasm Organelles Cytoplasm	Ribosomes Golgi Apparatus Mitochondria Lysosomes Peroxisomes	Flagella Vesicles Nuclear Envelope Nucleolus Chromosomes	Hypotonic Hypertonic Filtration Active Transport Endocytosis