

SCI3010 Human Anatomy & Physiology II

Course Syllabus Spring 2020-21



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Grade level: 11-12

Course Length: One semester (2nd semester)

Credit: 1/2 credit (3 college credits, MLC)

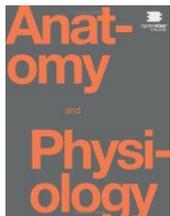
Prerequisites: Biology (B or higher each semester), Chemistry (C or higher each semester)
SCI2010 Human Anatomy & Physiology I

Description: A study of the structure and function of the human body. Integumentary, skeletal, muscular, nervous, cardiovascular, and respiratory systems are covered. (Note: This is a college level course!)

"I will give thanks to You, for I am fearfully and wonderfully made; Wonderful are Your works, and my soul knows it very well (Psalm 139:14)."

Rationale: This second course in the series offers a basic foundation for understanding the form and function of the human body focusing on the endocrine, lymphatic, immune, cardiovascular, respiratory, urinary digestive and reproductive systems. Such knowledge is needed in all health-related fields and in also in athletics.

Required Texts:



OpenStax College. (2013). Anatomy & Physiology. Retrieved from the OpenStax-CNX Web site: <https://legacy.cnx.org/content/col11496/latest>

If you view the text online, it is free. Download it from this page. If you prefer a hardcopy, [go to Amazon](#). (I got mine in a week for \$52 which is a real bargain.)

ISBN-10 1938168135 ISBN-13 978-1-938168-13-0 Revision AP-1-001-DW

Course Objectives:

1. To appreciate the wonder and complexity of the human organism. We are "fearfully and wonderfully made" formed by some 200 different cell types and the products of those cells.
2. To recognize and give examples of the relationship of **form and function** at all levels of organization. DNA and our environment both guide our development.
3. To be able to explain the basic form and function of the nervous, endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary and reproductive systems of the human body.
4. To be able to explain the form and function of the various types of receptors in the nervous system.
5. To be able to give definitions of common medical terms that occur in connection with the above systems.

6. To be able to outline the chemistry of metabolism and predict the effects of imbalances.
7. To understand how homeostasis is related to health and normal function and be able to give examples of imbalance and restoration.
8. To appreciate that truly "we are fearfully and wonderfully made" and be able to give examples.

Expectations:

Students are expected to learn names, locations, forms and functions of the parts of the body. Regular quizzes are provided within the lessons. In addition two proctored exams and a final will also be given. Two short papers are also required.

The instructor will assume that you are willing to learn and do extra reading if there are areas of chemistry or biology in which you lack background. Online learning requires self-discipline. Students should be sure to maintain the schedule and to understand all of the requirements of any assignment.

Students that fail to complete assignments on time can lose points on that activity.

Grading:

Grading Scale

Major Exams (2 x 20%)	40%
Quizzes/Participation (after lessons & in forums)	25%
Papers (2)	15%
Final exam	<u>20%</u>
	100%

Letter Grades:

98-100 A+	87-89 B+	87-89 C+	67-69 D+	
93-97 A	83-86 B	73-76 C	63-66 D	0-59 F
90-92 A-	80-82 B-	70+72 C-	60-62 D-	

College Credit: This course, is eligible for 3 college semester-hr credits with Martin Luther College. Separate application and fee are required for this credit. (See detailed instructions on course site in Moodle.) If the credit is transferred from MLC to another college, its acceptance is determined by that college depending on how it fits their programs.

General Course Outline and General Schedule

“Lesson Guide Sheets” will be available in Moodle to direct the students through the material.

Week	Text Chapters	Topic
1	Chapter 15	Autonomic Nervous System
2		Brain Overview

3	Chapter 17	The Endocrine System
4	Chapter 18	Blood
5	Chapter 21	The Lymphatic System Immunity
6	Chapter 21	Immune System
7	Chapter 23	Digestive System Anatomy
8	Chapter 23	Digestive System Physiology
9	Chapter 24	Cellular Metabolism
10	Chapter 25	Urinary Anatomy
11	Chapter 25	Urinary Physiology
12	Chapter 26	Fluids, Electrolytes, Acid-Base Balance
13	Chapter 27	Reproductive System
14	Chapter 28	Reproductive System
15		Overview

THE WRITING ASSIGNMENTS:

Two short papers of at least 600 words are required. The due dates are listed in the schedule.

A writing component is included. The act of writing not only helps a student to clearly communicate with others, but forces the student to think through the topic and gain deeper understandings before communication occurs. "I write to think and to understand."

Accordingly, the student will write two clean, structured, roughly, two-page reports on topics listed in the schedule. The paper should document all sources of information. A good paper will thoughtfully reflect on the state-of-the-art research including a Christian viewpoint on efforts that indicate "love of neighbor" in the case of alleviating suffering or that probe any ethical issues.

The evaluation of the paper will depend on the following:

1. Mechanics: Spelling, Grammar, and Punctuation
2. Format: In text references, Bibliography
3. Structure: Logical outline, Introduction, Thesis statement, Support paragraphs, Conclusion
4. Writing Style: Academic tone (no contractions or slang), Objectively written (no "I"). This is a formal paper. The passive voice is generally preferred in science (although some are questioning this practice).

The substance of the paper should be informative and detailed. Be sure to have sufficient sources that are up-to-date. Sources should be cited in the text and the bibliography.

Define terms and explain functions as if writing to an intelligent audience that is not majoring in biology.

5. Support your thesis with full and fair consideration of the other viewpoints. Provide smooth support of your thesis throughout the paper. (As opposed to tacking an opinion on the end of the paper).

6. Give appropriate credit to sources for ideas and quotations.

7. Provide annotations in the bibliography (at least one). An example is given below. Do annotate all web sources referencing possible bias if any.

- based on Medina, Suzanne. "Term Paper Checklist." *The Teaching Professor*. October, 1997.

Paper topics: (Topics can be modified or additional subjects can be approached subject to approval of the instructor.)

First paper:

1) What can be done to increase the supply of blood for transfusions? Can we change types of blood and/or make an artificial blood?

2) Should vaccinations be required; why is there fear and controversy? What are the two sides of the coin here?

3) Transplants: problems with supply and demand: what to do about it. See <http://www.bbc.co.uk/news/world-asia-25550419>

4) Compare and contrast viruses and bacteria.

Second paper:

1) Does our culture promote unrealistic body images for females?

2) Diet plans: do they have a basis in science?

3) What are the hazards of treatments and medicines that are outside of standard practice?

4) What does the drug, "Molly," do to the human body? What are the risks?

A paper might start out like this:

Scientists are now able to mass-produce immune cells and antibodies using mice. The ready supply of these materials not only has revolutionized the study of the immune system itself but also is having enormous applications in medicine, agriculture, and industry (NIAID). This paper will show how this growing area of research is a blessing that God is granting us.

An ethical rationale (how should I act) in your paper is required to support your position on the issue. I will look for both a Christian viewpoint and a secular argument. A Christian viewpoint can include a clear reference to a particular commandment, (or more generally, love of God or love of neighbor) or other specific Scripture. An additional approach could be to explore Dietrich Bonhoeffer's Ethics.

Bonhoeffer says that to live is to answer as Christ would, acting responsibly both to God and to mankind (Bonhoeffer, 1955, p. 220).

Christian viewpoint is, of course, important; however, because this may have little effect on some people, an effort should also be made to appeal to all people through reason and common sense. For example, one might argue what would happen if all people acted like this, or one might ask if all should be treated the same (Kant)? Your professor once argued at Carthage College that if human embryos can be sacrificed for medical purposes, then according to Kant's "categorical imperative," we would have to allow (in a thought experiment) that this could have ethically been done at the embryonic stage to us or to someone that we hold very dear.

One might also argue for the greater good (Mill). One might argue for respect of the autonomy of the individual (Kant). That an individual is an end in itself and not the means for another to use. Virtue ethics such as bravery, character, or trustworthiness (Aristotle-MacIntyre). Another approach can be to refer to the list of basic human rights contained in the charter of the United Nations.

Footnotes are not required in this paper. Sources, however, should be credited **in text** by parenthesis. For example here is an in text citation:

The mitochondrion could not decide as part of its personal survival plan that it should become part of our cells (Gould, 1989, 310).

By the way, note that above item is not even a quote... Gould's *idea* is credited.

Next, the paper's bibliography should include all sources that have been cited in the text. In addition, **annotate the best (or most provocative) source** that you found, indicating its value to your paper.

Examples of annotations where the thesis was that the science of paleontology is changing:

Gould, Steven Jay. Wonderful Life: The Burgess Shale and the Nature of History. New York: W. W. Norton and Co., 1989.

Gould writes about the nature of interpreting the fossil record. He skillfully uses the details of the Burgess Shale of British Columbia to reveal the human side of doing science. He tells of how the reinterpretation of evidence can tell a different story. Gould's style is elegant and witty and one can learn much from him even though he writes from an evolutionary perspective.

Lambert, David. The Dinosaur Data Book: The Definitive, Fully Illustrated Encyclopedia of Dinosaurs. New York: Avon Books, 1990.

Ideas about dinosaurs have changed considerably since the Andrews expedition. This book is a treasure of details about dinosaurs. Many illustrations and included, even a Protoceratops laying eggs. This large paperback has drawings of the members of the suborder Ceratopsia, showing sizes relative to common animals. Major fossil sites are indicated. This book gave most of the details I needed for my paper.

The Internet contains a great deal of information: both good and bad. Be very critical of what is found.

Annotate all web sites. Remember that there is no general required peer review of what is posted. Look for bias and valid authority. For example:

Stapleton, Stephanie. "Some Funding, Many Questions." <http://www.ama-assn.org/sci-pubs/amnews/pick_01/hll10827.htm> (posted Aug 27,2001), Aug 28, 2001.

This is from the American Medical Association's web page and contains the reactions of many doctors and scientists to President's Bush's announcement to allow federal funding of research on 60 lines of stem cells that already exist. The Christian Medical Association is quoted here as objecting to the President because this will cross a moral line.

Note this annotation of the site establishes its reliability (AMA) and indicates when the writer of the paper visited the site (Aug 28, 2001). Web sites may disappear, but it would be strange if all of yours were gone when I read your paper. ☺ All web sites should be annotated. At least one source should be annotated.

If you are familiar with a particular method of documentation, you may use that method for this paper. The important thing is to be consistent in your paper if choices have to be made.

A draft copy of each paper should be reviewed by another person. This can be any friend or relative. Indicate who proofed your draft on the final copy at the end.

The thesis sentence of your paper should appear in the first or second paragraph of your paper and should be explicit. Just what is it that you intend to say in this paper? Tell the reader what to expect.

Luther rightly said, "What does this mean?" Ask yourself as an "expert" in the area you have researched, what is the message I wish to give to my reader? A list of facts without perspective is meaningless. Facts need to be selected and organized to support a viewpoint. Such a viewpoint might be expressed in a thesis that states: "Snowbirds should not be protected. They are a danger to all other life." Reflect...react...consider the other side of the coin...be fair...support.... "What does this mean?" is the Lutheran approach. This involves risk.

Often papers can be improved by including a personal experience, a quotation, or a diagram.

I am looking forward to reading your papers. The secret to a good product is to start early. Avoid the pressure of doing everything just before the deadline

Second Semester Lab Activities

- 1.6 An evaluation of your diet using the glycemic index (GI) of foods.
- 2.4 Finding iron in your favorite cereals using a magnet.
- 3.10 Controlled study of osmosis using a carrot, or a piece of celery, slice of potato, or a raisin.
- 4.5 Counting neutrophils in a sample of blood.
- 5.4 Taking your pulse from various locations on the body. Finding your resting heart rate.

- 5.6 Taking your blood pressure.
- 6.5 Heart rate and recovery measurements under various conditions.
- 6.10 Calculation of your target training rate
- 7.5 Measuring breathing rate and comparing to heart rate.
- 8.4 Estimating and measuring vital capacity
- 10.8 Recording weekly caffeine intake in diet
- 12.6 Lab Activity with Saliva and taste
- 13.6 Experiment with oil, water and detergent to demonstrate the function of bile
- 14.6 Calculation of possible permutations with combinations of chromosomes

ALHS Online Policies:

Current ALHS Online policies are listed in the *Handbook for ALHS Online Students and Parents*, available on the ALHSO.org website. This includes policies on non-discrimination, anti-harassment, student expectations, attendance, academic honesty, student discipline, student grades, course add/drop, etc.

Please note the policy on **class attendance** which states in part:

“Even if a student’s local school does not have school on a particular day (snow day, teacher’s conference, quarter break, choral fest, class trip, etc.) ALHS Online courses will continue to meet and students are expected to complete required work on time.”

Students also fall under the policies of the school were they attend as a full-time student. When applicable, these same local school policies will be applied to enrollment in this ALHSO course.