The Well-Trained Mind Academy
Anatomy and Physiology Lab
Example Syllabus

Please note: The fall and spring semesters of this lab cover different material. We recommend that students interested in science take both semesters. However, students may choose to register for the fall or spring semester only, depending on transcript needs.

Required Materials:
Students must obtain lab materials in advance in order to successfully conduct lab investigations by the scheduled due date. All materials should cost no more than $100.
Materials List

Required Text(s):
None required, though a high school anatomy textbook is highly recommended for reference. The Anatomy and Physiology course uses Shier, D., Butler, J., & Lewis, R. *Hole's Essentials of Human Anatomy & Physiology. 10th edition*. New York, NY: McGraw-Hill, 2009. *Text ISBN: 9780072965636*

Course Description:

This course will provide an in-depth exploration of human anatomy and physiology through laboratory investigation. Students will conduct investigations related to the topics of physiological response to exercise, eye, lung and heart physiology, and perception (fall semester) and skeletal system structure and function, muscle physiology, and nervous system physiology (spring semester). Course content includes, but is not limited to, studying and applying the experimental method, composing lab reports, engaging in peer review with classmates, and presenting lab results.

Course Goals:

Upon completion of the Anatomy & Physiology Lab course, successful students will have practiced applying the experimental method to explore and test basic principles of Anatomy & Physiology. Students will learn to think scientifically, which entails becoming adept at developing hypotheses, designing controlled experiments, collecting and interpreting data, conducting scientific investigations, presenting results, and thoughtfully engaging in scientific discourse.

Grading:

Students' grades in this course are given separately for the fall and spring semesters. For each semester, the grade is determined by weighted categories, divided as shown in this chart:

Lab Reports	**50%**
Discussion Boards and Mid-Semester Test Discussion Boards: 70% Mid-Semester Test: 30%	**10%** (7%) (3%)
Participation Results Presentations/Questions: 50% Class Discussion/Group Work: 50%	**30%** (15%) (15%)
Final Exam	**10%**

Lab Reports and Presentations:

Composing lab reports is a major component of this course. A complete lab report includes an abstract, an introduction containing the background information necessary to justify a hypothesis (together with its underlying reasoning), the materials and methods necessary to test the hypothesis, data collected during the experiment, and any analysis performed on and conclusions drawn from the collected data. Details on the format and content are available in other class documents.

It is *highly recommended*, but not required, that students keep a personal lab notebook. A useful notebook contains not only all lab reports to date, but also notes taken during experiments, as well as the step-by-step procedures and methods that may not be written out in a report. Lab notebooks are not the same as archived work or formal lab reports—they allow the scientist to make connections between the knowledge and conclusions from various labs, add notes on procedures, and use previous experience to improve future experiments.

Discussion Boards and Mid-Semester Test:

To supplement the hands-on practice of scientific methods and procedures, students will write a set of discussion board posts for each lab, analyzing their own experience and relating it to their peers' results. Students will also take a brief mid-semester test (worth three discussion boards), which will test students' knowledge and understanding of the first four labs of the semester. These non-lab assignments will encourage reflection on completed labs and measure growing mastery of the basic principles of scientific thought and investigation.

Participation:

Weekly class meetings will involve class discussion of previous and upcoming labs. Participation will be assessed in a two-week block for each lab, so there will be eight participation grades earned during the semester.

To earn full class participation points for each lab, students must meet the following criteria:

- Present lab results in class when assigned to do so, OR volunteer at least one relevant, thoughtful question for labs when they do not present (50%)
- participate in discussion of lab topics on weeks when results are not presented, via chat, mic, or both; participate actively in any group work assigned (50%)

**Requirements vary for students in the delayed section; please email Mrs. Neace for details.*

Final Exam:

The semester will conclude with a final exam, which will rely on students' observations of and notes on peer presentations in the final lab of the semester. Students will reflect on, analyze, and evaluate peer experiments, demonstrating an understanding of basic ideas of biology, fundamental principles of scientific thought and investigation, and sound experimental design and critique.

Attendance Policy:

Students **must obtain prior approval from the instructor** before missing a live lecture (at least **24 hours' notice**). Although the lectures are recorded, it is imperative that students attend and participate in the live lecture class. Students are permitted to substitute 3 delayed lectures for live lectures each semester and must obtain prior approval from the instructor in order to retain the attendance credit for participation. **Unexcused absences** will be recorded, and students who **miss more than 25% of the class lectures** (unexcused absences) will receive no grade, nor a certification of completion for the course.

Late Work Policy:

Students submitting any work assigned by the instructor late will incur a **10% reduction in grade for each day the work is late**. Extenuating circumstances requiring an extension **MUST** be discussed with the instructor **at least 1 week in advance** of the assignment's due date.

Schedule:

Note that each semester is self-contained and introduces principles of experimental method and design; for full-year lab students, the spring introductory lesson will build on the fall semester's work.

Fall 2022

Week	Lecture Topic	What's Due?
1	Exp. Method/Intro Lab 1 (Heart Rate)	Lab Safety Contract
2	Writing and Presenting Results	Discussion Board 1 Original Posts
3	Intro Lab 2 (Reaction Time)	Lab Report; DB1 Replies
4	Lab 2 Results	Lab 2 Results; DB2
5	Intro Lab 3 (Exercise & Memory)	Lab Report 2; DB2 Replies
6	Lab 3 Results	Lab 3 Results; DB3
7	Intro Lab 4 (Cow Eye Dissection)	Lab Report 3; DB3 Replies
8	Lab 4 Results	Lab 4 Results; DB4
	Fall Break: No Class	
9	Intro Lab 5 (Hearing Frequency)	Lab Report 4; DB4 Replies
10	Lab 5 Results	Lab 5 Results; DB5; Midterm Quest
11	Intro Lab 6 (Sheep Heart/Lung Dissection)	Lab Report 5; DB5 Replies
12	Lab 6 Results	Lab 6 Results; DB6
13	Intro Lab 7 (Muscle Fatigue)	Lab Report 6; DB6 Replies
14	Lab 7 Results	Lab 7 Results; DB7
	Thanksgiving Break: No Class	
15	Intro Lab 8 (Self-designed)	Lab Report 7; DB7 Replies
16	Lab 8 Results	Lab 8 Results

17	**Exam Week: No Class**	**Final Exam; Lab Report 8**

Spring 2023

Week	Lecture Topic	What's Due?
1	Exp. Method/Intro Lab 1 (Peripheral Vision)	Lab Safety Contract
2	Lab Reports and Presenting Results	Discussion Board 1 original posts
3	Intro Lab 2 (Muscle Identification)	Lab 1 Report; DB1 Replies
4	Lab 2 Results	Lab 2 Results; DB2
5	Intro Lab 3 (Sound and Blood Pressure)	Lab Report 2; DB2 Replies
6	Lab 3 Results	Lab 3 Results; DB3
7	Intro Lab 4 (Sheep Heart/Lung Dissection)	Lab Report 3; DB3 Replies
8	Lab 4 Results	Lab 4 Results; DB4
	Spring Break: No Class	
9	Intro Lab 5 (Color Distinction)	Lab Report 4; DB4 Replies
10	Lab 5 Results	Lab 5 Results; DB5; Midterm Quest
11	Intro Lab 6 (Reproduction)	Lab Report 5; DB5 Replies
12	Lab 6 Results	Lab 6 Results; DB6
13	Intro Lab 7 (Reaction Time)	Lab Report 6; DB6 Replies
14	Lab 7 Results	Lab 7 Results; DB7
15	Intro Lab 8 (Self-designed)	Lab Report 7; DB7 Replies
16	Lab 8 Results	Lab 8 Results

17	**Exam Week: No Class**	**Final Exam; Lab Report 8**