

# BIO340: Human Anatomy and Physiology I

## Fall 2007 Syllabus

**Instructor:** Chrystal Ho Pao, Ph.D.

**Office:** McLennan 133

**Office Phone:** 847-317-4181

**Office e-mail:** chopao@tiu.edu

**Lecture:** McLennan 212  
TR 10:50am–12:05pm

**Office Hours:** Wed 9 – 10 am  
Fri 12 noon – 1 pm  
and by appointment

**Laboratory:** McLennan 113

**Lab 1:** Monday 1:15-4:05 pm

**Lab 2:** Thursday 1:40-4:30 pm

**Human Anatomy and Physiology I and II Course Description:** “An in-depth study of the anatomical and physiological features of the following human body systems: integumentary, skeletal, muscular, nervous, circulatory, digestive/metabolic, lymphatic, and endocrine. Relevant clinical information and pathology are discussed. A strong emphasis is placed on experimental study and analysis of physiological processes.” (TIU catalog)

**Course Objectives:** This course aims to assist each student in learning the complex structures and functions of the human body. The first semester examines the organization of the human body, skeletal system, muscular system, and nervous system.

### Course Materials:

**Required** (To be used for BOTH semesters)

- *Principles of Anatomy and Physiology*, G.J. Tortora and B. Derrickson, 11<sup>th</sup> Ed., John Wiley and Sons, Inc., 2006.
- *Human Anatomy & Physiology Laboratory Manual (Cat Version)*, Elaine N. Marieb, 8<sup>th</sup> Ed. Benjamin Cummings, 2005.
- A bound, graph-ruled laboratory notebook
- A good quality dissecting kit.
- Safety glasses

### Recommended:

- *Anatomy & Physiology Coloring Workbook*, Elaine N. Marieb, 8<sup>th</sup> Ed, Pearson Benjamin Cummings, 2006. (**Strongly recommended**)
- *Anatomy and Physiology Flash Cards*, I.E. Alcamo, Bryan Edwards Publishing.

## Course Policies:

### Attendance

**Lecture:** Students are expected to attend lecture and come prepared to take an active part in the learning process. **Periodically, students will be called upon in class to answer questions. Therefore, it is essential that students keep up with reading assignments and frequently review class notes.** However, students are allowed up to three (3) absences if necessary. For each of the three absences not used, 1% point will be added to the composite score, for each absence beyond the three, 1% will be deducted from the composite score. **Classes missed for sports, field trips etc., even if cleared in advance with the instructor, count toward the three allowed.** (Note, however, that if you were to have 4 or more excused absences you would not be penalized, but would also not receive the attendance bonus.)

**Please note: Cell phones and other electronic devices not used for note taking,** which are a distraction to the entire class, **must be turned off in class.** Violations will result in the student being asked to leave the class and receive an unexcused absence.

**Laboratory:** Attendance is **REQUIRED.** One unexcused absence will drop the course grade by one full letter. Two absences will drop the grade by two full letters. Three absences will result in failure of the course. Prompt attendance to lab is **mandatory** due to the hands-on nature of the laboratory exercises. Points will be deducted from one's laboratory exercise for tardiness. Since the lab exercises often require partners and specific amounts of materials prepared in advance, students must attend only the lab section in which they are enrolled to avoid unnecessary disruption. Exceptions to this policy are extremely limited, and students are required to contact the instructor at least seven (7) days in advance regarding extraordinary situations that interfere with attendance to one's enrolled lab section. An absence will be considered EXCUSED only if granted by the instructor and the student makes up the missed laboratory work within a reasonable time period (1 to 2 weeks maximum).

**Examinations:** Unexcused absences will be recorded as a zero. Excused absences can be made up on the student's own time, scheduled **in advance** with the instructor.

**EXCUSED ABSENCES for lecture, laboratory, exams, or field trips MUST be granted by the instructor IN PERSON and IN ADVANCE. Blanket notices of extracurricular events such as sports, field trips, etc. are not considered adequate reasons alone for excused absences. See the instructor in person and in advance if you wish to be excused for such events.**

## Coursework Requirements:

### Examinations:

There will be three in-class examinations and a non-cumulative final exam during finals week; in addition there will be three (3) laboratory practicums. These are designed to cover each system or subject studied. **Any material discussed in class, laboratory, or**

**in the reading assignments is fair game for exam questions.** Point values of exams will be 100 points each.

### **Formal Written Laboratory Report:**

A formal written report will be required for one (1) lab exercise as designated on the lab schedule and should be handed in on the posted due date. The lab report is worth 100 pts, 50 points for the draft and 50 points for the final version. Ten (10) points will be deducted for each day a report is late. No points will be given for any report that is turned in more than one week late. The lab report should be written in the format as described in appendix 2.

### **Laboratory Notebook:**

#### **Lab notebook, Lab Manual, and Textbook MUST be brought to all lab sessions.**

The lab notebook is a permanent copy of your work in the laboratory. All experimental observations and data for **each exercise** done in the lab should be recorded in the notebook according to the guidelines and format given in appendix 1. The laboratory write-ups in the notebook will be graded for adherence to format, completeness, and logical conclusions based on the data. Particular emphasis will be placed on the conclusions of the experiment, which should show understanding of the scientific principles being tested. Observations and notes during dissection should also be kept in the laboratory notebook. The laboratory notebooks will be worth a total of 200 points. Students, who do not have their laboratory notebook, do not submit their book for grading, or who have not completed the pre-lab write-up, will receive 0 points for the assignment.

## **COURSE POLICY ON PLAGIARISM AND CHEATING**

**PLAGIARISM**, which is defined as utilizing another person's ideas, works, or words as if they were one's own, without identifying the source, will not be tolerated in any form, including written papers, exams, notebooks, or oral presentations. If you have questions regarding what is or is not considered plagiarism, please clarify with the instructor before handing in the assignment.

**CHEATING**, which is defined, as any form of fraud or deception that results in a better grade or even a better impression of the student's performance than she/he actually earns or deserves, will not be tolerated.

**INCIDENTS OF PLAGIARISM OR CHEATING** will be dealt with severely by the instructor. The penalty will include, at least, a zero for the assignment(s) involved, but could include failure of the course. Incidents of plagiarism and cheating will be reported to the Academic Dean, who has the authority to undertake further disciplinary measures in accordance with TIU policy on community standards violations.

## **Course Grading:**

Lecture/lab quizzes		100 pts.
Lecture Exams	4 x 100 pts.	400 pts.
Laboratory Practicum's	3 x 100 pts.	300 pts.
Formal Laboratory Report	50 draft, 50 final	100 pts.
Laboratory Notebook	10 X 20	200 pts.
Tissue classification map	20	20 pts
<b>Course Total</b>		<b>1120 pts.</b>

## **Grading Scale\***

A	94-100%	C+	76-78.9%
A-	90-93.9%	C	73-75.9%
B+	86-89.9%	C-	69-72.9%
B	82-85.9%	F	0-68.9%
B-	79-81.9%		

**Please Note:** No “D” grades will be awarded in this course. It is an upper level course in your major. You will be expected to perform at a C- level or better to pass the course.

\*The final grade will be based upon an objective point evaluation. However, the student should not overlook the influence of one’s general impression, which includes attendance, promptness, class participation, and attitude. One’s general impression is helpful in determining borderline grades.

**Attention Athletic Training Education Program Students:** the National Athletic Trainers’ Association Educational Competencies that are covered in this course can be viewed at the ATEP home page by following the link to:

[https://portal.tiu.edu/uportal/tcathletictraining/course\\_competencies](https://portal.tiu.edu/uportal/tcathletictraining/course_competencies)

Please select the course you are currently enrolled in to view the specific competencies and proficiencies associated with this course.

**Lecture Schedule\***

<b><u>Date</u></b>	<b><u>Chapter</u></b>	<b><u>Topic</u></b>
Aug. 23	1	Course Policies & Introduction to Anatomy
Aug. 28	1	Introduction to Anatomy
Aug. 30	2	Biological Chemistry
Sept. 4	3	Cell Structure and Function
Sept. 6	3	
Sept. 11	4	Tissues
Sept. 13	4	
<b>Sept. 18</b>	<b>Exam 1</b>	<b>Chapter 1 - 4</b>
Sept. 20	5	Integumentary System
Sept. 25	5	
Sept. 27	6	Skeletal System – Bone Tissue
Oct 2	6	
Oct. 4	7	Skeletal System –Axial
Oct. 9	7	
<b>Oct. 16</b>	<b>Exam 2</b>	<b>Chapter 5 - 7</b>
Oct. 18	8	Skeletal System – Appendicular
Oct. 25	8	
Oct. 30	9	Joints
Nov. 1	9	
Nov. 6	10	Muscle Tissue
Nov. 8	10	
<b>Nov. 13</b>	<b>Exam 3</b>	<b>Chapters 8 - 10</b>
Nov. 15	<b>11</b>	Muscular System
Nov. 20	11	
Nov. 27	12	Nervous Tissue
Nov. 29	12	
Dec. 4	13	Spinal Cord & Spinal Nerves
Dec. 6	13	
<b>Dec. 13</b> Thur 10:30 am	<b>Final Exam</b>	<b>Chapters 11 - 13</b>

\*Subject to change based on time constraints and the requirements of pedagogy.

## Tentative Lab Schedule:

Date	Study Focus	Lab Exercise
8/22 Lab 1 8/23 Lab 2	Scientific Method and Metrics The Language of Anatomy Organ Systems Overview	<b>p. xvii-xviii</b> (do at home) <b>Ex. 1</b> Act. 1, 2, (3), 4, 5 <b>Ex. 2</b> All
8/27 Lab 1 8/30 Lab 2	The Microscope The Cell: Anatomy and Division	<b>Ex. 3</b> Act. 1, 2, 3, 4, 5 <b>Ex. 4</b> All, do Act. 1-3 at home
9/6 Lab 2 9/10 Lab 1	<b>The Cell: Transport Mechanisms and Cell Permeability (First Draft of Formal Report due 9/13 [sec 2] or 9/17 [sec 1])</b>	<b>Ex. 5A</b> Act. 1, 2, 3, 4, 6, 7
9/13 Lab 2 9/17 Lab 1	Classification of Tissues <b>Histology slide show</b> Integumentary System Classification of Covering and Lining Membranes	<b>Ex. 6A</b> Act. 1, 2, 3, 4 Histology Atlas p.729 <b>Ex. 7</b> Act. 1, 2, 4 <b>Ex. 8</b> Act. 1, 2
9/20 Lab 2 9/24 Lab 1	<b><u>Lab Practical Exam #1</u></b>	<b><u>p xvii, Ex 1 - 8</u></b>
9/27 Lab 2 10/1 Lab 1	<b>**Final Draft of Formal Lab Report Due**</b> Overview of the skeletal system Skeletal System: Axial	<b>Ex. 9</b> <b>Ex. 10</b>
10/4 Lab 2 10/8 Lab 1	Skeletal System: Appendicular, & Articulations Body Movements	<b>Ex. 11</b> Act. 1-5 <b>Ex. 13</b> Act. 1, 2, 5, 6, 7
10/15 Lab 1 10/18 Lab 2	Human Muscular system	<b>Ex. 14</b> All <b>Ex. 15</b> Act. 1, 2, 4, 5
10/22 Lab 1 10/25 Lab 2	Dissection: Cat muscular system	<b>Dissection Ex. 1</b> p.751-767
10/29 Lab 1 11/1 Lab 2	Dissection: Cat muscular system	<b>Dissection Ex. 1</b> p.751-767
11/5 Lab 1 11/8 Lab 2	<b><u>Lab Practical Exam #2</u></b>	<b><u>Dissection, Ex 9 - 15</u></b>
11/12 Lab 1 11/15 Lab 2	Nervous System: Histology ( <b>Incl. Lecture</b> ) Dissection of the Cat Spinal Nerves	<b>Ex. 17</b> All <b>Dissection Ex. 2</b> p.768-772
11/19 Lab 1 11/29 Lab 2	Spinal Cord & Autonomic Nervous System Human Reflex Physiology	<b>Ex. 21</b> Act. 1, 2, 4, 5 (skip tract name & dissection) <b>Ex. 22</b> Act. 1, 2, 3, 8
12/3 Lab 1 12/6 Lab 2	<b><u>Lab Practical #3</u></b>	<b><u>Dissection Ex 2,</u></b> <b><u>Ex 17, 21, 22</u></b>

**\*Refer exercise and page numbers to *Human Anatomy & Physiology Laboratory Manual (Cat Version)*, Elaine N. Marieb, 8<sup>th</sup> Ed. Benjamin Cummings 2005.**

**Please Note:** During some lab times I will also lecture on material that you will be responsible for lecture and/or laboratory examinations.

Your laboratory notebook is your permanent copy of your work in the laboratory. **You must have it with you in the laboratory at all times. All experimental data, observations, and conclusions should be recorded in your lab notebook, NOT in your lab manual.** Entries should be in black ballpoint ink. Do not erase or white out any errors in your notebook. Draw a single line through any information you do not wish to include. Do not tear any pages out of your notebook. If you wish to delete an entire page, simply draw a large X across the page. The format for the notebook and experimental entries should be as follows:

1. Number all pages in the notebook consecutively.
2. The hard cover of your notebook is your Title Page. The title page should include your name, your assigned laboratory partner's name, the name of the class section, and the inclusive dates covered by the experiments in the notebook. Keep pages 1 through 3 free for a Table of Contents. The table of contents should include for each exercise: the date, title of the laboratory exercise, and the page in your notebook where it is written up.
3. **Each report should include the following:**
  - a. **Title, Date, and Lab partner(s).**
  - b. **Purpose:** Before coming to the lab, read the assigned information and write a general statement (1 to 2 lines long) that describes the objective(s) of EACH exercise.
  - c. **Materials and Methods:** Make a list of major equipment and materials you will use in the order you will need it. Outline a brief step-by-step procedure or make a flow chart that you can follow to perform the required exercises. Leave room for any revisions or additions to the procedure that might be made in the laboratory. Write only on the right-hand pages, leaving the left-hand pages (facing pages) blank for additions and corrections. For dissections, there is no need to write out the detailed procedure of every cut. But one needs to highlight tricky steps and lists organs to be identified.
  - d. **Data and Observations:** In this section, record what you actually discover in the laboratory. Any data collected, sketches drawn, or observations made should be written here as you do the experiment.
  - e. **Results:** Organize your raw data into a table or graph if necessary. Data tables should be formatted so that the information is clear and readily retrievable. Include and explain any necessary calculations, statistical tests or data manipulation.
  - f. **Conclusions:** Discuss or explain what your data means in a written paragraph form. Summarize and interpret your results. Discuss any unexpected results and offer a possible explanation for them. Follow the guidelines in the laboratory manual and or handouts and include answers to any questions posed therein.

## WRITING THE FORMAL LABORATORY REPORT      APPENDIX 2

The formal laboratory report is a more extensive evaluation and interpretation of the results of an experiment than in the short informal report written in your lab notebook. The exact nature of the report will depend upon the nature of the experiment being discussed, however, a suggested format is described below and a sample journal article is attached.

1. **Title Page:** Give the experiment a brief, clear title that describes the subject of the report. Include your name, your partner's name, the date of the report's submission, and the class.
2. **Abstract:** This is a short paragraph containing a very concise summary statement of the purpose of the experiment and its major conclusions. This is usually prepared after the rest of the report is drafted. **Single Space** this portion and keep it very brief, no longer than 4 or 5 sentences.
3. **Introduction:** This section should be several pages long (~3-5) in which the study is introduced, the nature of the problem addressed, and the approach should be outlined or discussed. A clear statement of the purpose for doing the experiment should be made in the last paragraph. This last paragraph should be written in Active First Person Plural Voice. The purpose for doing the experiment should be placed in perspective with reference to similar previous works. (Some library research or referral to the textbook may be required to understand the background or historical perspective of the experiment performed). Related work by other experimenters should be referenced if known. This section as well as the rest of the report should be PAST TENSE whenever it is referring to **work you did** or to **work that other have done**. You can say, "We know that...", present tense, when discussing known facts of a relevant nature to your report. Careful attention should be paid to verb-tense agreement. When the active voice is used, "We" is preferable to "I". **DO NOT simply copy or paraphrase introductory material found in the manual or textbook.** This should be written in your own words with any reference material used clearly cited.
4. **Materials and Methods:** All experimental procedures and materials used should be described in sufficient detail so that another experimenter could reproduce your work exactly without repeating your errors. However, generally used or understood materials or techniques do not have to be described. (e.g. You do not have to say a hot plate was used to boil water.) Be sure to mention any special problems that arose during the experiments as well as any special precautions found necessary. ***Do not copy*** procedures from the lab manual or handout. These should be written in your own words in a **Narrative Form (passive voice) and in past tense**, NOT a numbered sequence of events.
5. **Results:** All observations and *final* experimental results should be presented in this section. Data should be presented in clearly labeled tables and graphs. Label tables as Table 1, Table 2, etc. and graphs as Figure 1, Figure 2, etc. Tables should have a descriptive title and Figures should have a legend describing what is contained in each. In addition to the tabular representation of data, **a separate NARRATIVE summary of your results that refers to EACH figure and table by number completes the results section of your report.** This should be a part of the text of the report in **full paragraph form**.
6. **Discussion and Conclusions:** In this section, discuss your results, **explaining the significance** of what you have observed and draw conclusions. DO NOT merely reiterate your results. Explain WHY you think you got them. An attempt should be made to explain negative findings and to comment on sources of error in light of the procedures used and in consideration of known information about how the body works. However, keep in mind that your **results**, not your errors, should be the focus of your discussion. You should draw attention to differences and similarities between your

results and those of other researchers if you can. Point out the relevance of your conclusions to the life processes of the animal studied and any relationship to human biological processes. If your results differ from expected data, in light of background information, you should note this and try to explain why. Don't come up with your own theories to try to explain erroneous data. It is **essential** to consult texts and reference material in the preparation of this section.

7. **References: List all references consulted.** Your reference list should be organized in alphabetical order by name of the first author of each article. Citations in the text should be done by numbering your reference list (alphabetically), and using the number of the article, in superscript, as the citation indicator in your text. The reference list should be at the end of the paper, and provide the names of the authors, year of publication, title of paper, journal or book, volume, pages.

**Examples:**

***Journal Article***

**Ho, C.,** Conner, D., Ladd, D., Kifor, O., Brown, E., Seidman, J. G., Seidman, C. E. 1995. A mouse model for Familial Hypocalciuric Hypercalcemia and Neonatal Severe Hyperparathyroidism. *Nature Genetics* 11: 389-394.

***Book***

Pitelka, D.R., and F.M. Child. (1964). Review of Ciliary structure and function. In: Biochemistry and Physiology of Protozoa, Vol. 3 (S.H. Hutner, ed.), Academic Press, New York, pp. 131-198.

**LAB REPORTS WILL BE GRADED STRICTLY ON THE FOLLOWING SCALE:**

***Points:***

- 90-100 This grade will be given for a **superior report**. The paper should follow **the format exactly**. The writing should be precise and grammatical. Experimental work should be reported thoroughly and in such a way that someone else could repeat your final procedures without repeating your errors. Calculations should be done correctly and data presented in a clear form. The results of the experiment should be discussed clearly and demonstrate a creativity and understanding that the average student lacks.
- 80-89 This grade will be given to a report that is **generally acceptable** but flawed in one or two minor ways (awkward grammar, or a conclusion not properly arrived at, etc.). In spite of flaws, the overall impression should be that the experimental work was good and the principles understood well by the writer.
- 70-79 This grade will be given for a report with **only one serious flaw** (incorrect calculations, missing one piece of data, or inappropriate discussion, etc.) Otherwise, the paper should show that the experiment was carefully performed and generally understood.
- 60-69 This grade will be given to a report with **major flaws** in grammar, organization and experimental data. It indicates that the experiment was done, a report written, but with little or no understanding on the part of the writer.
- 0-59 This grade will be given to a report that has **no redeeming qualities**. It indicates that your body was in the lab but your mind was on vacation. Also, any report, no matter how well done, will receive a grade of **zero** points if it is OVER ONE WEEK LATE.

## **Homework: Tissue Classification Map**

## **APPENDIX 3**

Due 9/20 for lab 2, 9/24 for lab 1.

Consult p. 66 of the laboratory manual to construct a classification map to identify each of the following tissue type:

Epithelium:

Simple squamous epithelium, simple cuboidal epithelium, simple columnar epithelium, pseudostratified columnar epithelium, stratified squamous epithelium, stratified cuboidal epithelium, stratified columnar epithelium, transitional epithelium

Connective tissue:

- Embryonic connective tissue: mesenchyme
- Loose connective tissue: areolar, adipose, reticular
- Dense connective tissue: dense regular, dense irregular
- Cartilage: hyaline, elastic, fibrocartilage
- Bone
- Blood

Muscle tissue:

Skeletal, cardiac, smooth

Nervous tissue