

# UTAH STATE UNIVERSITY- EASTERN

HUMAN PHYSIOLOGY (BIO 2420);

Fall 2017; 4 Credit course

Lecture: MWF 11:30am-12:20pm (Reeves Room #186)

Lab: Thurs 9:00-10:50am (Reeves Room #234)

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**Instructor:**

Tyson D. Chappell PhD.

**Email:**

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**Office:**

Reeves #261

**Office Phone:**

613-5345 or Science Secretary 613-5316

**Office Hours:** MWF ~8:15am-9:15am, TH 10:50 to 11:30am, WF: 12:20pm to 12:50pm or email or call and I am happy to meet when you are able.

**Course Description:**

This course focuses on the **function** of the human body. It concentrates on cell membrane function within various systems. Students will study the dynamics of structure as-well-as the coordinated functional interaction between organs within systems. It is a laboratory and personal study intensive course.

**A good background in chemistry, physics, and biology are GREATLY beneficial** to students in this course. You have been advised/warned.

This course is required for all nursing students and recommended for students in premedical, pre-dental, pre-veterinary, and other allied health pre-professional programs. Students taking the course must enroll for both lecture and laboratory.

Right from the start let's delve into some philosophy. If you are going into Nursing, Medicine, Pharmacy, Physical Therapy, Dentistry, etc, WHEN do you think you are supposed to learn about human Physiology? Do you think that once you are in your programs that your instructors THEN are going to go through all the details of human function with you? No, once you are in your health field programs you ALREADY need to have a deep understanding of physiology. NOW IS THE TIME, HERE IS THE PLACE when and where you need to be emerging yourself in this world of study and drinking deep from the wells of physiological knowledge. NOW is the time to build your physiology foundation which you will need to already have established for your futures in the health care fields.

Finally, this course is difficult and you will need to learn a LOT. Would you really want it any other way? When you, or your family, or friends are being cared for due to health problems don't you want the doctors and nurses to be as knowledgeable and highly trained as possible? To properly care for people and save their lives it will take your sacrifice to succeed and gain this information. This class, as well as anatomy, can, will, and should separate those that truly want to be in the health field and take part in saving lives as well as having a very good job for the rest of their lives vs others who don't want to do what it takes to succeed.

**Course fees:** \$30 to be used for cow eyes, cadaver use fees, gloves and other safety gear, muscle stimulators, blood typing kits, blood glucose devices and test strips, stethoscopes, sphygmomanometers.

**Pre-requisites:**

Any one of the following: [USU 1350](#), [BIOL 1010](#), [BIOL 1500](#), [BIOL 1610](#), [BIOL 2060](#), [BIOL 2320](#), [CHEM 1010](#), [CHEM 1110](#), [CHEM 1210](#), AP Biology or AP Chemistry with a score of 3 or higher.

**Textbook and Supplies:**

1. (Required): **Principles of Human Physiology**; Author: Stanfield, Cindy; Publisher: Pearson; ISBN: 978-0-321-819345; current edition: 5<sup>th</sup>. (Earlier editions can be used however, the student will be responsible for keeping up with any material inconsistent with the 5<sup>th</sup> ed.). **Customized version= Human Physiology; ISBN 978-1-269-11666-4**

2. (Required): Human Physiology: Concepts and Clinical Applications; Author: Fox, Ira; Publisher McGraw Hill; ISBN: 9787-0-07-729617-9; current edition: 14<sup>th</sup> . Students must use a NEW laboratory book (and current edition). Customized options ISBN = 9781121844100

3. (Optional yet recommended): Anatomy and Physiology Revealed 2.0 (or 3.0 is the online version): An Interactive Cadaver Dissection Experience; McGraw-Hill Higher Ed. ISBN: 978-0-07-337807-7.

4. Recommended: that students have one **additional** physiology text available for study. Physiology is a subject, unlike Anatomy so much, that can be explained in various ways. Having an extra text will often be **very helpful** in order to clarify points which may be confusing, or to reinforce principles which are considered important.

5. A great book that is FREE to use as a reference to our course book (along with the numerous anatomy books on reserve in the library) can be found here: <https://openstaxcollege.org/textbooks/anatomy-and-physiology/get>. You could even donate just a few bucks as an incentive for more free books to be made available to everyone.

### **Course Objectives:**

Because of their complexity, certain systems require more time to address in both lecture and laboratory. Less complex system are addressed in lecture-laboratory. At the end of the semester, students will learn:

- 1. Significant factual info/knowledge regarding human physiology and some anatomy.**
- 2. To apply course material (to improve thinking, problem solving, and decisions) in order to exhibit mastery of information reviewed and studied in this course.**
- 3. To develop specific skills, competencies, and points of view needed by professionals in the field most closely related to this course.**
- 4. How to find and use resources for answering questions or solving problems**
5. The cell membrane (and its function) in general.
6. The role of enzymes in healthy and diseased states.
7. The different methods in which energy is produced within the cell.
8. To identify the structure of different muscle cells and how the structure enables the cell to function in its unique way.
9. The chemical communication that occurs between various endocrine glands and the metabolic response produced by these signals.
10. How syncytial muscle tissue and conducting muscle tissue interact to produce coordinated heart activity.
11. The basic components requisite to produce in electrical impulse and how it propagates down an axon.
12. The basic structure and function of specific regions of the brain.
13. The function of sensory receptors in the skin and eyes.
14. The proteins involved with muscle contraction and the order of events from nerve stimulation at a muscle to contraction and relaxation.
15. The role of the heart in producing pressure to pump blood through the body
16. The role of blood in transporting oxygen as well as the function of the various white blood cells.

**Required Student Skills:** Ability to take notes, follow directions, attend class PROMPTLY, and respond to a lecture teaching method consisting of white-board discussion and multimedia presentations.

### **Student Assistance:**

I will be using Canvas for the management of this class. All reserve materials, including my power point lectures, the syllabus, class schedule, and updated grade sheets, will be available through Canvas. To access Canvas, go to the web address: <https://usu.instructure.com/login> . Student "A numbers" and password will be required to login. Privacy is your responsibility. You will be responsible for every email and quiz submitted under your name. You

will also be held accountable for every email I send through Canvas. You will want to check Canvas regularly. Canvas has many useful features (your assignment scores, student study resources, animations, etc.) and you should take the time to explore them from within our course page. You may also contact Debbie Pearson if you have trouble logging on or questions regarding use 613-5716 [debbie.pearson@usu.edu](mailto:debbie.pearson@usu.edu)

For the rare situations in which you find yourself missing a lecture, I will have previous semester lectures on video for you to use to preview or review the class material. It is also not advised that you miss class intentionally with the hopes that you will be able to merely watch the lecture from home. Many students have tried this but view make is successful. **Panopto is meant to be used as a backup in case of emergency and to review material for exams, not as a substitute for attending class.**

### **Library References:**

Some anatomy and physiology software with animations and numerous physiology text books which may be very helpful in gaining various viewpoints when studying physiology this semester.

### **Assignments:**

Assignments will be due for every chapter. These assignments will be accessible on canvas and will be open book. Assignments are meant to help you study, learn, and review the material to prepare you for exams. Exam questions will be similar, although not necessarily identical to the assignments. Assignments will have 20 questions to answer. Each correct question is worth  $\frac{1}{2}$  a point for a total of 10 points if turned in on time, or 0 points for turning it in late. Pay attention to Canvas and at the end of this syllabus for each assignment's due date. I will not remind you every day when these are due. As with most things in the course, YOU must be responsible for your own success or failure. These assignments can help you greatly with your final grade IF you complete all of them and earn ALL of your points. It would essentially be like taking one exam open book vs the closed book status of all the normal exams.

### **Laboratory:**

The lab manual is an important source of material that will give the student additional contact with the required information that will need to be learned prior to quizzes and exams. On exams I will directly pull some questions from the lab book to make sure that you are using your lab books and completing your lab assignments. Weekly lab assignments are meant to help you review and better learn the subject material. The assignments are not meant to be mere "busy work". Assignments require the student to answer specific questions (sometimes hypothetical questions) and sections that can be found in the syllabus schedule. **3** times this semester you will need to hand in all completed assignments. The completed lab manuals turned in on time are each worth **50** points. Incomplete assignments or those turned in late will not be worth more than 50% credit and additional points will be removed from incorrect answers. It is very important that you stay on top of these questions as they can build up fairly quickly. Follow the syllabus closely to keep up to date and on track. You may turn in your assignments anytime earlier than the due date. Remember, the assignment is meant to help you learn. If you're just writing down the answers from your friend, you're really not taking the class seriously and your grade will reflect as much.

Do all that you can to earn all of your laboratory points. Some of you will unfortunately miss a higher grade by only a very few points. Don't let this happen to you. Earn all your laboratory points. You will likely need them to buffer the difficult exams.

No food or drink is allowed in lab when performing dissections. Students will work in self-assigned groups of two to four in lab depending upon the particular lab. However, lab reports should be your own.

**No lab book points can be earned if you do not attend lab when experiments or procedures are being performed for a respective lab book section.**

### **Exams:**

Exams will include material from lecture notes, class discussions, and material found in the lab and textbook. There will be **7 exams** that will be taken in the Testing Center on campus. Each exam will allow 2 hour for their completion. Exams are worth **150 points**. There will be NO make-up exams without adequate evidence for a justified reason as to why you didn't take your exam when it was available. **No exam will be dropped**. You have two to three days (check schedule for specifics) to take your exam/quiz. Do not procrastinate until the last exam day as frequently students will feel fine on the first or second day the exam is available, but then unfortunately become sick on the

final day of the exam. Students are individually responsible to schedule their exams during the

You must bring picture identification to be admitted for the exam.

**Testing center hours of operation M-Th: 8:30 to 9:30pm (last test given out at 9pm). Friday: 8:30-7:30 (last exam given at 7pm).**

You must bring picture identification to be admitted for the exam. The Testing Center phone (435) 613-5325, the Director is Cathrin Alaei.

Furthermore, I will inform you of the relevant clinical applications in each chapter that will need to be understood in some detail to the extent that you will be able to explain a specific disease or disorder.

### **Classroom Policies:**

1. **Cheating** – Cheating in any form will not be tolerated. This includes, but is not limited to, intentionally using or attempting to use or providing others with unauthorized information, materials, or study aids in any academic exercise or activity. Substituting for another student, or permitting another student to substitute for oneself, in taking an examination or preparing academic work is also considered a form of cheating. In the testing center you can NOT taking in your own scratch paper. If you need **paper** to write anything down on, it must be **requested** of the testing center helpers and that paper must be turned back in prior to you leaving the center. Do not throw it away. Give it to the helpers to dispose of. Absolutely NO cell phone use or any other electronic aids are permitted without prior approval. Those who cheat will be removed from the class roll, and will be subject to the college’s disciplinary measures..
2. **Attendance** – Class attendance is your responsibility. However, it has been shown that students who attend classes regularly have a higher grade than those who do not. **I definitely do mind tardy behavior.** Please do not come to class late, it is disruptive for those who come on time and are trying to focus and understand the lecture.

The amount of material covered every lecture and lab is significant. I advise you, missing any class, or leaving early is not going to help you learn the information any better. We will be covering huge amounts of information and you must be prepared prior to each class by having already read that day’s material ahead of time otherwise you may become swamped with new material and lost very easily.

**Class Courtesy** – I reserve the right to remove any student from my class that may be disruptive or hinder the educational progression of any other student. Please be courteous to other students and **turn off cell phones and DO NOT TEXT MESSAGE** during class. Also turn of the keyboard “clicks” to your tablet devices. Furthermore, it is an embarrassment to you and wastes your time to come to class, put your head down on your desk, and fall asleep. It is highly possible that someone will be kicked out of class this semester for disrupting the educational pursuits of the other members of the class. Do not be this student. Once kicked out, you will not be allowed back into class without first discussing the matter with me in my office as well as writing a letter to the class and apologizing for your disruption. Finally, AVOID being a distraction to other students at all costs. You DO NOT have the right to disrupt another student's pursuit of knowledge.

**Library Use:** Students are encouraged to use the library as I have requested A&P Revealed to be placed on reserve there for library use only. Many online physiology resources are also available. Check youtube for lectures, animations etc, regarding particular physiology concepts.

### **Student Support Services (SSS)/Accommodations for Students with Disabilities:**

If a student has a disability that qualifies under the Americans with Disabilities Act (ADA) and requires accommodations, he/she should contact the Disability Resource Center for information on appropriate policies and procedures. Disabilities covered by ADA may include learning, psychiatric, physical disabilities, or chronic health

disorders. Students can contact DRC if they are not certain whether a medical condition/disability qualifies. You may contact the DRC by phone (435)613-5337, email [karl.burnside@usu.edu](mailto:karl.burnside@usu.edu) or visit the office located at JLSC 223.

Student counseling services are also available in the Office of Student Success. Please contact Darrin Brandt by phone (435)613-5670 or email at [darrin.brandt@usu.edu](mailto:darrin.brandt@usu.edu) to set up an appointment. This is a free service to USU Eastern students.

**Grade-Determination Method:**

Total points are distributed as follows:

Completed laboratory assignments turned in 3 times: @ 50 points each.....	150 pts.
Chapter assignments: 13 @ 10 pts each.....	130 pts
7 exams: @ 150 points each .....	1050 pts.
<b>Total Points.....</b>	<b>1330 pts.</b>

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To receive a B or an A grade, you will need to spend the appropriate amount of focused study outside of class e.g. each credit should merit 3 hours of studying outside of class. Ergo, a 4 credit class should find you studying at least 12+ hours outside of class each week to attain an A or B. If this amount of studying is not adequately assisting you in earning the grade that you desire, perhaps additional time may be required as well as serious reflection on your study habits.

**Extra Credit:** At random times I will give extra credit (EC) points for answering questions in class, often relating to the lecture material, or for answering additional questions on exams.

**DO NOT ASK FOR EXTRA CREDIT THROUGHOUT THE SEMESTER AND DEFINITELY DON'T ASK FOR IT AT THE END OF THE SEMESTER EVEN IF YOU NEED JUST A FEW MORE POINTS ON YOUR GRADE.**

**Every day, every hour, every exam is important. Work for your grade. Work to understand and learn the material. It is all on you. Your education, your life, your drive, and your reward.**

In addition, +5 points will be given to students that fill out their online student evaluation form for this course. You will need to **print off the last page of the evaluation that indicates the completion of the course evaluation. Turn this printed page into me immediately afterwards.** An additional +5 points will be given to all if 80% of the class also fills out the student evaluation form. Details will be coming in ~13 weeks. When filling out the course evaluation, please pay extra attention to your feelings regarding the course objectives as mentioned above in bold highlights. Thank you.

**Grading Scale:**

The total points obtained by each student will be turned into a letter grade. The grading scale is:

- A** (94% -100%), **A-** (90% - 93%)
- B+** (86% - 89%), **B** (83% - 85%), **B-** (80% -82%)
- C+** (76% - 79%), **C** (73% - 75%) , **C-** (70% - 72%),
- D+** (66% - 69%), **D** (60% - 65%),
- F** (those at or below 59%)

Final word on your final grade, my job is very easy when the final exam is over. Your final grade will directly reflect the grade you EARNED. Some students will miss a higher grade by only a few points. Your grade is YOUR grade. I spend 15 weeks trying to help you learn the material and earn all the points you can. The standard for your grade is the points that you have accrued, no more, no less.

**The instructor reserves the right to alter the grade-determination method and following schedule if necessary.**

# Physiology 2420; Fall 2017:

Week	Day	Date	Text Chptr	Topic/text book pages	Notes/Exams/Assignments
1	M	28-Aug		Syllabus	<b>Student Purge. Pay up!</b>
	T	29-Aug			
	W	30-Aug	1	Intro to Physiology p. 1-16	
	TH	31-Aug		Tissue identification: Exercise 1.2: ALL	Microscope use. 1.2 Microscopic examination of tissues
	F	1-Sep	1	Intro to Physiology p. 1-16	
2	M	4-Sep		Labor Day	
	T	5-Sep			
	W	6-Sep	1, 2	Finish CH1, CH2 Cell Metabolism p 20-39, 46-53 (56-75, 82-89)	
	TH	7-Sep	2	LAB: Homeostasis: 1.3=ALL; 2.4 rev act 1-14 (not #9 or 11). CH2 Cell Metabolism p 20-39, 46-53 (56-75, 82-89)	1.3 Homeostasis (pt B only), 2.4 Enzyme activity
	F	8-Sep	2	CH2 Cell Metabolism p 20-39, 46-53 (56-75, 82-89)	Due: Assignment 1 CH1. You must be paid up fully by TODAY to prevent your purge!
3	M	11-Sep	2	CH2 Cell Metabolism p 20-39, 46-53 (56-75, 82-89)	
	T	12-Sep			<b>Exam #1</b> text book CH 1, 2 Sept 14-18th
	W	13-Sep	2	CH2 Cell Metabolism p 20-39, 46-53 (56-75, 82-89)	
	TH	14-Sep	3	Cell Membrane Transport. P 59-97 (93-121)	
	F	15-Sep	3	Cell Membrane Transport. P 59-97 (93-121)	Due: Assignment 2 CH2
4	M	18-Sep	3	Cell Membrane Transport. P 59-97 (93-121)	Last day to drop without "W"
	T	19-Sep			
	W	20-Sep	3	Cell Membrane Transport. P 59-97 (93-121)	
	TH	21-Sep		2.6 Review act questions 1-10, 12, 13	2.6 Diffusion and Osmosis (use osmosis tubing) #1-10, 12, 13. Explain NaCl ionizing in water.
	F	22-Sep	4	Chem. Messengers. P 94-115 (124-145)	Due: Assignment 3 CH3
5	M	25-Sep	4	Chem. Messengers. P 94-115 (124-145)	
	T	26-Sep			
	W	27-Sep	4	Chem. Messengers. P 94-115 (124-145)	
	TH	28-Sep		4.1: ALL Histo of Endocrine; 4.2: review act ques 1-9, 15, 16; 4.3 rev act ques 1-10, 12, 13	4.1 (histology of Endocrine), 4.3 (Insulin shock) Measure blood glucose
	F	29-Sep	4	Chem. Messengers. P 94-115 (124-145)	<b>Exam #2;</b> Cell membrane transport and Chemical messengers. Sept 29-Oct 3.
6	M	2-Oct	5	Endocrine system. P94-115 (148-163)	Due: Assignment 4 CH4
	T	3-Oct			
	W	4-Oct	5	Endocrine system. P94-115 (148-163)	
	TH	5-Oct	6	Nerve cells and signaling. P142-169 (166-193); animations	3.1 (nerve) ALL.
	F	6-Oct	6	Nerve cells and signaling. P142-169 (166-193)	Due: Assignment 5 CH5. <b>Lab books due #1.</b> Sections: 1.2-1.3, 2.4, 2.6, 4.1-4.3
7	M	9-Oct	6	Nerve cells and signaling. P142-169 (166-193)	
	T	10-Oct	6	Nerve cells and signaling. P142-169 (166-193)	
	W	11-Oct	7	Synaptic transmission. P218-234 (196-212)	<b>Exam #3;</b> Endocrine and Nerve cells/signaling. Oct 11-16. Due:

					Assignment 6 CH6
	TH	12-Oct		3.2=no experiment but answer all review act questions. 3.3=Reflex arc tests. Answer all questions.	3.2, 3.3
	F	13-Oct	7	Synaptic transmission. P218-234 (196-212)	
8	M	16-Oct	7	Synaptic transmission. P218-234 (196-212)	
	T	17-Oct			
	W	18-Oct	8	Central nervous system. P175-210 (215-250)	Due: Assignment 7 CH 7
	TH	19-Oct	8	CNS lecture. Observe human brain	<b>Friday schedule</b>
	F	20-Oct		Fall Break	
9	M	23-Oct	8	Central nervous system. P175-210 (215-250)	
	T	24-Oct			
	W	25-Oct	8	Central nervous system. P175-210 (215-250)	
	TH	26-Oct	8	Central nervous system. P175-210 (215-250)	
	F	27-Oct	8	Central nervous system. P175-210 (215-250)	<b>Exam #4;</b> Synaptic transmission and CNS. Oct 27-31st.
10	M	30-Oct	9	Sensory systems. Don't read photo transduction but add visual pathways. P239-281 (254-277)	Due: Assignment 8 CH 8. Mar 20-21st. Last day to drop without "W"
	T	31-Oct			
	W	1-Nov	9	Sensory systems. P239-281 (254-277)	
	TH	2-Nov	9	Inner Monkey video. Take notes. Exam 5 will have questions from video. Lecture on CNS after video.	
	F	3-Nov	9	Sensory systems. P239-281 (254-277)	
11	M	6-Nov	9	Sensory systems. P239-281 (254-277)	
	T	7-Nov			
	W	8-Nov	9	Sensory systems. P239-281 (254-277)	
	TH	9-Nov	9	Sensory systems. P239-281 (254-277). Cow eye dissection.	3.4-3.5. Answer all questions. Last day to drop the class.
	F	10-Nov	9, 10	Sensory and Muscle lecture	<b>Exam #5;</b> Sensory. Nov 10-14th.
12	M	13-Nov	10	Muscle physiology. P295-322 (322-348)	Due: Assignment 9 CH9
	T	14-Nov			
	W	15-Nov	10	Muscle physiology. P295-322 (322-348)	Turn in lab books: 2nd time: 3.1-3.5
	TH	16-Nov		Muscle physiology; functional anatomy of muscle and mechanics of contraction; Muscle stimulators: tetanus, treppe etc.; Find multiple points for specific forearm muscle contraction. Find minimum threshold for a muscle to contract. 5.1 all rev. act questions minus #11. 5.2= Muscle stimulators: twitch, tetanus, treppe. Rev. Act. Questions 1-8 hypothesize when necessary. 5.3: all review activity questions 1-14	5.1-5.3
	F	17-Nov	10	Muscle physiology. P295-322 (322-348)	
13	M	20-Nov	10, 12	Muscle physiology. P295-322 (322-348), Cardiac function	
	T	21-Nov			Due: Assignment 10 CH 10 by midnight
	W	22-Nov			
	TH	23-Nov		Thanksgiving Holliday	
	F	24-Nov			
14	M	27-Nov	12	Cardiac function. P381-404 (367-390)	
	T	28-Nov			
	W	29-Nov	12	Cardiac function. P381-404 (367-390)	

	TH	30-Nov		Cardiac function; Effect of Caffeine on HR. Cardio physiology; 7.1 answer drug effects on heart. Answers found in lab book. Rev act ques= 1-12; 7.2 ALL; 7.3 ALL; 7.4 only Review act. questions 1-8. 7.5= Stethoscope practice and Rev. Act Questions for 1-15; Observe heart	7.1-7.3, 7.5. One person use the EKG under the influence of caffeine. Use Stethoscope. Listen to heart valves. Check systole and Diastole pre and post Caffeine.
	F	1-Dec	12	Cardiac function. P381-404 (367-390)	<b>Exam #6;</b> Muscle and Cardiac function. Dec 1-5th.
<b>15</b>	M	4-Dec	11	Blood vessels, flow, pressure. P334-355 (394-415)	Due: Assignment 11 CH 12
	T	5-Dec			
	W	6-Dec	11	Blood vessels, flow, pressure. P334-355 (394-415)	
	TH	7-Dec		Blood; 7.6 ALL; 7.7 ALL; Stethoscope practice	7.5-7.7
	F	8-Dec	11	Blood vessels, flow, pressure. P334-355 (394-415)	
<b>16</b>	M	11-Dec	14	Blood. P440-454 (432-446)	Due: Assignment 12 CH 11
	T	12-Dec			
	W	13-Dec	14	Blood. P440-454 (432-446)	
	TH	14-Dec		6.1 Hematocrit Rev. Act. Questions 1-16. 6.2= RBC count. WBC identification, Blood typing; Rev act quest 1-15; 6.3: ALL; 6.4: only Rev act. Questions 1-14	6.1-6.4
	F	15-Dec	14	Blood. P440-454 (432-446)	<b>Turn in lab book 3rd time:</b> 5.1-5.3, 6.1-6.4, 7.1-7.7
	M	18-Dec			Due: Assignment 13 CH 14 by 12pm
	T	19-Dec			
	W	20-Dec		<b>Exam #7:</b> Blood vessels and Blood. Anytime this week.	
	TH	21-Dec			
	F	22-Dec			