Fundamentals of Human Physiology 435
Spring 2015 Semester Syllabus

LECTURES: 9:55-10:45 M-W-F Room 140 Bardeen

Each 50 minute lecture will contain three parts: 1) presentation via PowerPoint of published data and conceptual renderings taken from both research journals and relevant textbooks, 2) presentation of an in-class problem that students will be required to discuss and answer as a group, 3) resolution and clarification of the in-class problem and its answer. There will be assigned readings in a *required* textbook that should be completed prior to lecture. To ensure completion and comprehension of these assigned readings, study guide questions and practice activities will be utilized during discussion classes.

TEXTBOOK (*REQUIRED*)**: Medical Physiology, A Systems Approach**
Editors: Raff and Levitzky
Publisher: McGraw Hill-LANGE
ISBN: 978-0-07-162173-1

NOTES: Course packets may be purchased from Student Print Services at 333 East Campus Mall, Room 3301. Additional handouts will be distributed in class as appropriate.

INSTRUCTORS:

Beth Altschafl, PhD
Room 137 SMI
Phone: 890-1865
altschafl@wisc.edu

Andrew J. Lokuta, PhD
Room 136B SMI
Phone: 263-7488
ajlokuta@wisc.edu

TEACHING ASSISTANTS:

Sonalee Barthakur	**barthakur@wisc.edu**
David Belair	**belair@wisc.edu**
Caitlin Murphy	**camurphy3@wisc.edu**
Joseph Sepe	**sepe@wisc.edu**

PREREQUISITE COURSES: ***College-level introductory*** Biology, Chemistry, and Physics are assumed.

WEB PAGE: Grades, announcements, quizzes, and course materials will be posted electronically on Learn@UW: https://learnuw.wisc.edu/ If you are unfamiliar with this web tool, or experience difficulties accessing the site, please contact Dr. Altschafl.

PURPOSE OF THE COURSE (5 credits):

Physiology 435 will challenge students to understand both the cellular and the molecular mechanisms underlying human physiology. It will therefore require integration of prior information learned from multiple disciplines including Biology, Chemistry, and Physics. Furthermore, by emphasizing the experimental

techniques and data interpretation that give rise to accepted tenets of human physiology, Physiology 435 will facilitate the students' consideration of what constitutes healthy living. It is common for students to bring into the classroom their preconceived ideas and a notion of how our bodies work and what is best for its function. These notions tend to be powerfully shaped by a poorly-informed, profit-driven media. These misconceptions become pervasive and perpetuate media and market successes, thereby ensuring that the 'snake oil salesmen' continue to get your money. Physiology 435 will give students tools to become better consumers of health-related information, make better choices about healthy living, and to be cognizant of the ways that advertising intentionally misdirects.

In addition to daily reading assignments in an advanced human physiology textbook, students taking Physiology 435 will be required to read excerpts from *The Golem: What You Should Know about Science* by Harry Collins and Trevor Pinch. This book contains seven case studies which challenge "the traditional view that science is the straightforward result of competent theorization, observation, and experimentation". During their weekly laboratory period, students will orally discuss and explore these reading assignments. It is here that Liberal Arts & Science criteria are definitively addressed as the discussions will invariably range over the conduct of scientific inquiry, the most appropriate interpretation of the results, the social implications of the data, and the responsible reporting to the masses. This aspect of the course will afford the students an appreciation for science, not simply as a way of systematically defining the natural world, but also as an integral process for informed decision-making within the larger context of political, economic, and social issues. Students will be guided to discuss questions concerning: the relationship between science and society, whether this relationship has always been mutually beneficial, whether mass media portrays scientific data and conclusions correctly, and the role of the scientist in this relationship given the social and political forces that influence the messages that the public receives regarding their health and its maintenance.

LABORATORY:

The weekly three-hour laboratory period will be an inquiry-based exploration of hypotheses that student groups of 3-4 write and test using available transducers and equipment in the Physiology department. Specifically, it is the students who will assemble objective information, formulate hypotheses, and devise an experiment to answer an authentic physiological question that their group develops. The Physiology 435 students will then be given the necessary guidance and equipment to noninvasively measure physiological data, interpret the results, and place it in the broader scope of the natural world. A ten page written report of their results and conclusions will be given to a Department of Physiology faculty member for authentic review and comment. After making the necessary changes (and possibly additional experiments), the lab groups will submit their paper for publication in the *Journal of Advanced Student Science.*

DISCUSSION:

The weekly 50 minute discussions will be led by teaching assistants and provide students an opportunity to ask questions in a small-group setting. Original worksheets and other learning activities designed by the course instructors will be utilized during this meeting. Exams will also be returned and discussed in these sessions. Attendance to these weekly meetings will be recorded and therefore contribute to the final course grade.

EXAMS:

The exams will contain 40 multiple choice questions (to be electronically scored) and 4-6 short answer essay questions.

The examination schedule is as follows (note these are all *evening times*):

EXAM 1	**Tuesday Feb 17th**	5:00 - 7:00 pm
EXAM 2	**Tuesday Mar 17th**	5:00 - 7:00 pm
EXAM 3	**Tuesday Apr 21st**	5:00 - 7:00 pm
EXAM 4	**Friday May 15th**	5:05 - 7:05 pm

FINAL GRADES:

Final grades are based on unit exams, in-class questions, quizzes, discussion attendance, and laboratory scores. More specifically, exam one will be 16% of the final grade, exam two will be 17% of the final grade, exam three will be 19% of the final grade, and a cumulative exam four will be 20% of the final grade. On-line quizzes, discussion attendance, and in-class problems will be 8% of the final grade (2% per exam unit). The final laboratory score will be 20% of the final grade.

The following absolute standards of achievement will guarantee at least these grades:

A	90.00-100%	**AB**	88.00-89.99%
B	80.00-87.99%	**BC**	78.00-79.99%
C	70.00-77.99%		
D	60.00-69.99%		
F	59.99-And Below		

More information about exams and grading is outlined below under Policies and Procedures.

CHANGING SECTIONS:

Because the class is enrolled at maximum capacity, we cannot simply grant permission for you to switch lab/discussion sections. It is possible to switch, however, if you take the initiative to identify other individual students willing to change sections on a one-to-one basis. To help with this, we created a bulletin board on the Learn@UW site where you list the section you have, which section you want, and your name/email address. If you can't find a match, then switching sections will not be possible. DO NOT DROP THE COURSE IN ORDER TO SWITCH SECTIONS. If you find someone willing to switch sections with you, contact Mary Walker (mjwalker2@wisc.edu) with the necessary details (names, ID#'s, section numbers) so the switch can be administered without losing your course registration. **All section switches must be completed by Friday, January 30th.**

COURSE POLICIES AND PROCEDURES

TECHNOLOGY POLICY:

Use of electronic devices to take notes during lecture will be allowed. **However**, if you engage in activities on the device that are not class-related and are observed by our TAs sitting in the back, then **you will lose** this privilege for the remainder of the semester. These distracting activities include but are not limited to:

1) use of email and other social media.
2) checking news, sports, weather, etc.
3) online shopping.
4) online information searches.

COMMON COURTESY AND TOLERANCE:

If you arrive early to lecture, please fill seats beginning from the center of each row. That way, late-arriving students won't have to trip over your backpack and step on your new cell phone as they struggle to get to the empty seats. Also, please arrive on time and quiet down immediately when the lecture begins, so we can get the microphone level adjusted for everyone to hear. **We also ask that you turn OFF cell phones and refrain from sending or receiving text messages for the duration of the class.** Finally, please wait until the period has ended before closing notebooks, packing backpacks, etc, so you can hear the incredibly valuable exam info usually shared during the last minute of class ☺.

In addition, we feel that all students deserve a safe, welcoming environment in which to learn. We expect you to show each other (and the staff) sensitivity and respect with regard to individual differences including gender, race, culture, religion, and sexual orientation. Please talk to your instructors immediately if you feel that we, or anyone else associated with the course, behaves in a way that deprives you of the welcoming climate we intend.

EMAIL:

Email is a very convenient way for instructors and students to communicate about the course. We will regularly send messages to you via the Phys 435 classlist with announcements, content updates, and important course information. Email is also a great way for you to arrange appointments and get answers to your questions about course logistics. However, in a class this large, email can quickly become more of a burden than a benefit. The following rules will help minimize difficulties:

1. To avoid bursting your inboxes with junk, **students may not send messages to the classlist.** If you have an announcement you would like to share with the whole class, send it by email to any of the instructors, who will either read it in lecture or forward it to the classlist.

2. Do not "Cc:" or "Bcc" more than one staff member on emails. It wastes significant staff time when more than one of us has to respond to the same question. Send your email to the one person you think is most likely to have the answer you need; that person will forward the email if necessary to get you the best answer.

3. Try to compose emails in a way that doesn't require lengthy replies. You can certainly get help via email, but it works best if you pose your questions as yes/no questions. For example, if you're wondering about the answer to a particular study question, write-out what *you* think is correct, and we'll reply with a brief "yes," or a "no, and here's why." We attempt to respond to every email sent to us. But please don't be surprised or offended if our reply says "answer too long, come to office hours."

4. Email is not real-time, so don't use it to contact us about emergencies or if you need a quick answer! For example, if you send us an email at 3:00 one afternoon to tell us you cannot attend an exam that night, we may not see your email until the next day. Though we usually check email more often, you should assume that we will only check once each weekday. If you send us an email from an account other than your @wisc account, and days go by without any response, there's a good chance that our overzealous spam filters have unjustly junked it (particularly a problem if your hiLARious parents named you "Cialis"). When time is important, pick up the phone and call, or talk to us in office hours or lecture.

EXAMS:

1. Exam conflicts: Before the second week of class, you should check ALL 435 exam dates/times against scheduled exams in your other classes. We hold exams in the evening, as do some other large courses on campus (e.g., Physics, Chemistry, and Cell Biology). If you have another exam occurring at the same time as one of ours, first ask the professor of the smallest class to arrange an alternate time. If your other professors

refuse to accommodate you, contact a Physiology instructor with the name and phone number of that unkind professor, and we will work with you to arrange an early exam in our class. As a rule, we do not offer late exams because it delays the entire class from getting exam results back.

2. If you have a personal crisis that prevents you from attending an exam, contact your Physiology instructor *by phone* as soon as possible, and also contact the Office of the Dean of Students (263-5702) to notify them of your situation. Conflict with a work schedule does ***not*** constitute an excuse for missing an exam. If you have a job, ***let your employer know at the beginning of the semester*** when our exams will be, and make it clear that you cannot work at those times.

3. Although you will need a calculator on exams, you cannot use the type that is programmable (those that allow entry of text, formulas, etc). You will be allowed to use a basic scientific calculator with log functions. In the event that you don't have one of those and it would present a financial hardship to obtain one, a calculator will be made available for you to borrow. Cell phones and other mobile electronic devices must be OFF (not just put on "vibrate") and out of sight during both exam administration and exam review.

4. Exams will be available for review at the discussion section following each exam, and your TA will answer questions about any errors that you made. ***You will not be allowed to keep the exams, and if you don't show up to those discussions, you forfeit the chance to review your test.*** After reviewing your test with the TA, if you would like to challenge the answer to a particular question, you have one week to present your case to the instructor. Submit a concise explanation **via email**, citing textbook or other references where appropriate, and the instructor will return a final decision within one week of receiving your email.

5. Cheating: Please don't. Cheating is an insult to the honest majority of students, and also deals a subconscious blow to the cheater's own self-esteem and confidence. When you knowingly cheat, you're pretty much confessing to yourself that you're a loser who is either too lazy to work or too much of a coward to accept the grade that you earn. So please don't cheat. Students caught cheating will be prosecuted according to the University Academic Dishonesty Policies and Procedures.

GRADING:

We do not set grade quotas in this class (e.g. final scores are NOT "curved" so that only 15% of you can receive A's). Our grading standards are "absolute", meaning that if the entire class earns over 90%, you will all get A's. We hope this encourages a climate where you will study together and help each other learn. (But remember, do NOT help each other *during* exams.) An unfortunate result of having such a large class, though, is that when final grades are being tallied there are generally dozens of students who are only fractions of a point below posted borderlines. While it is agonizing when only one more correct test question would have gotten you a higher grade, you may not go back and reexamine earlier tests to find a question to argue about (see the procedure for disputing questions above). And we can't simply lower the borderline for an individual student. That only transfers the agony to students just below the new borderline. Thus, grade borderlines are absolute, and unless there is an error recording or calculating your scores, your final posted grade cannot be changed. To guard against scoring errors and to make sure you are not unpleasantly surprised at the end of the semester, please keep close track of all test, quiz, and lab scores throughout the semester, and report problems immediately.

Finally, since we don't have sufficient staff time or resources to offer extra credit assignments to *everyone* in the class, we can't offer them to *anyone*.

AVOID A LAWSUIT:

We provide you with access to digital course materials that contain copyrighted material. Do NOT upload them to any of the online sites that sell course notes, PowerPoint slides, study guides, and the like. It is against the law, and publishers are beginning to prosecute individuals and companies involved. These companies are scamming students. Buying lecture notes or answers to study questions will not make you smarter. Taking your own notes and working out your own answers to questions that are posed will. So you should avoid buying materials for our course from online sites. For the tuition dollars you've already spent we will provide you with everything you need to be successful in our course.

SUGGESTIONS TO HELP YOU SUCCEED IN PHYSIOLOGY

TEACHING VS LEARNING:

A man points to his dog and tells his wife, "I taught Sparky to talk!" In amazement, she prompts the dog, "Say something, Sparky!" Sparky wags his tail and replies, "Woof!" She says to her husband, "What a liar, you said he could talk!" To which the man explains, "I said I ***taught*** *him to talk…I didn't say he* ***learned*** *to."*

A misconception held by some students (and professors) is that once something has been "taught," it has been "learned." There's a great difference, however, between receiving information (reading, hearing a lecture, looking at a diagram), and being able to reproduce or use that information correctly. The only way to demonstrate that you "know" something is to reproduce it in a context where others can evaluate it, like in a discussion or on an exam. Unfortunately, exams are often the first opportunity students use to assess their learning, and they sometimes find out the hard way that although they were taught a concept, they didn't really learn it. Seek opportunities to check your understanding before the exam by being an active participant in your education. Volunteer answers to questions in discussion, verbalize your understanding of concepts to a study group, take a blank piece of paper and see if you can reproduce and explain a complicated figure (to Sparky, if no one else is around). Learning is a process involving long-term (perhaps permanent) transformation of brain structure and function. It requires self-motivation, focused attention, assignment of priority to the subject, and a willingness to incorporate new ideas into your understanding of the world. It also takes time, effort, and repetition—learning takes work! While in many ways it is great to live in such a "connected" world, it takes self discipline to know when you need to disconnect from the world's distractions and focus your thinking on one task. There isn't a pill or a clever invention that you can buy to make it easier. Learning well simply requires hard work. Online services that make you pay for class notes, answers to study questions and other class materials, are lying to you when they claim they have something to sell you that will make learning easier. The Physiology 435 staff will make great efforts to teach well, but the ultimate responsibility for learning (and thus your grade) resides with you, the student. Though challenging, Physiology is a fascinating subject with relevance to your life, and we hope you enjoy learning it as much as we enjoy teaching it.

LEARNING TIPS:

Physiology is a difficult subject. For that reason, we'd like to offer some advice on how to make the most of the learning experience and to perform up to your potential:

1. **Keep up** with the material, rather than trying to cram in the two or three days before an exam.

2. **Attend every lecture** (as well as discussions and laboratories). The textbook readings cover a large range of concepts, and the best way to figure out which topics will be emphasized on exams is to hear what is emphasized in lectures. Furthermore, cognitive research suggests that something you learn by hearing and

seeing stays in your memory 5 times better than if you just read about it. You should participate actively in lectures: pay attention, take notes, respond to questions, and ask questions. We think it only fair to warn you that previous students who have taken advantage of their anonymity by skipping class have tended to get poor grades.

3. **Don't be a techno-victim.** While modern communication technology can do amazing things to enhance our lives, education experts are increasingly alarmed at the modern trend toward decreasing attention spans and intellectual achievements among high school and college students. While initially multi-tasking in the current generation of students was rationalized as being adaptive, data are emerging suggesting that it might actually be harming intellectual success. For example, recent studies have linked Facebook use to poor performance in college. In a culture where multi-tasking is the norm, many students think nothing of reading a textbook in front of the TV, with Facebook running on the laptop next to them and pausing at regular intervals to respond to text messages. It's becoming increasingly clear: If you don't take time to focus your mind fully on a task, you simply will not achieve your full learning potential. And not reaching your learning potential may keep you from realizing your career potential. The communication technology available to the modern student can be an awesome thing, but you must have the self-discipline to turn it off sometimes.

4. **University guidelines suggest that you should spend at least two hours** studying outside of class for every hour in lecture. Some productive ways to spend that time would be to:

- Look ahead at assigned book questions before lectures, so you'll recognize answers when you hear or read them.
- Actively take notes during lecture; participate by answering and asking questions. Turn your cell phones OFF during lectures. Maintain focus on physiology for the whole class period.
- Read assigned text pages within 24 hours after lecture, reading most closely the topics explicitly covered in lecture.
- Before the next lecture, rewrite your lecture notes and answer study questions.
- Work with a study group; discuss the material and compare answers to study or book questions.
- Attend office hours whenever you have questions. Instructors and TA's will hold office hours each week—help is available! (You should feel free to visit any TA's office hours.) Like discussions, office hours are an opportunity to ask more in-depth questions, and get thorough answers. DON'T put off asking your questions until just before a test. You're sharing the teaching staff with more than 100 other students, and it may be difficult for us to answer all of your questions at the last minute!