

PHM 480C: *Physiology, Pathophysiology and Drug Targets*

Fall 2016 Syllabus

LECTURE TIME: Wednesday and Friday 10am-11:50am

LOCATION: PHR 2.110

FACULTY

Course Director

Carla Van Den Berg, Pharm.D., Division of Pharmacology and Toxicology

Office location and phone: PHR 5.224A and DPI 2.208, 495-4715, carla.vandenberg@austin.utexas.edu

Lecturers

Richard Morrisett, Ph.D., Division of Pharmacology and Toxicology

Office location and phone: PHR 5.218C, 471-1911, ramorris@austin.utexas.edu

Rueben Gonzales, Ph.D., Division of Pharmacology and Toxicology

Office location and phone: PHR 5.224, 471-5192, rgonzales@austin.utexas.edu

Edward Mills, Ph.D., Division of Pharmacology and Toxicology

Office location and phone: BME 3.510D, 471-6699, tedmills@austin.utexas.edu

Dawit Kidane, Ph.D., Division of Pharmacology and Toxicology

Office location and phone: DPI 2.220, 495-4720, dawit.kidane@austin.utexas.edu

Michela Marinelli, Ph.D., Division of Pharmacology and Toxicology

Office location and phone: BME 6.114A, 471-0080, micky.marinelli@austin.utexas.edu

Christine Duvauchelle, PhD., Division of Pharmacology and Toxicology

Office location and phone: PHR 5.224, 471-1090; duvauchelle@austin.utexas.edu

Casey Wright, Ph.D., Division of Pharmacology and Toxicology

Office location and phone: BME 3.510C, 232-8331, Cww@austin.utexas.edu

John DiGiovanni, Ph.D., Division of Pharmacology and Toxicology

Office location and phone: BME 3.510E and DPI 2.228, 512-495-4726,
john.digiovanni@austin.utexas.edu

TEACHING ASSISTANT

TBD

REQUIRED COURSE TEXTS

Required reading assignments will be communicated by the lecturing Professor

Human Physiology: From Cells to Systems, 8th Edition, by Sherwood Publisher: Brooks/Cole, Cengage Learning. Copyright Year: 2013
Print ISBN-10: 1111577439 Print ISBN-13: 9781111577438

Pathophysiology of Disease: An Introduction to Clinical Medicine, 6th Edition, by The McGraw-Hill Publisher. Copyright Year: 2010
ISBN 978-0-07-162167-0 ISSN 1079-6185
<http://accesspharmacy.mhmedical.com/content.aspx?bookid=339§ionid=42811298>

Goodman and Gilman's The Pharmacological Basis of Therapeutics, 12th Edition, by The McGraw-Hill Publisher. Copyright Year: 2011
ISBN 978-0-07-162442-8
<http://accesspharmacy.mhmedical.com/book.aspx?bookid=374>

COURSE OBJECTIVES:

- Describe the fundamental structure and function of cells, tissues, organs, and organ systems in the human body.
- Understand the individual contribution of an organ/tissue and its interrelationship with other organ systems to maintain homeostasis.
- Apply functional physiological concepts to explain the pathophysiology of underlying common diseases encountered in the clinical setting.
- Develop a basic understanding of drug-receptor interactions.
- Recognize how pharmacologically targeting cellular, tissue or organ system abnormalities can influence human health or disease.

UT CANVAS WEBSITE, ELECTRONIC RESOURCES AND PRACTICES

1. Canvas will be your link to all course materials, grades and communications associated with this course. Therefore, it is mandatory that you visit the Canvas website and/or check your email a minimum of every other day. Canvas can be accessed from the UT homepage under the *Resources* section. There is no excuse for not checking these on-line or email resources regularly for communications.
2. You may also contact faculty members directly via phone or email for questions regarding lecture content. Their contact information is listed above.
3. Prior to exams, some faculty will answer questions emailed by posting to the Canvas discussion board. This enables all students to ask follow-up questions on a particular topic in an organized manner. Be aware that any message posted to the discussion board is available to all enrolled students and faculty.

COURSE POLICIES

1. Daily class attendance is expected. While the lectures are typically available on-line (more info on this later). Be aware that technical difficulties may occur, and there is no way of guaranteeing that all lectures will be available through this mode.
2. Please arrive early to class and be prepared to take the weekly quiz. Quizzes will start promptly at the beginning of class and will not be lengthened for those who are tardy.
3. Please be quiet during the lecture, but don't hesitate to ask questions especially if something is unclear (if you don't get it, many others probably don't either). The faculty encourage an interactive learning environment.
4. Please turn off your cell phone! Sleeping, playing computer games or web-surfing etc during class is distracting to your classmates and professors and will not be tolerated. You may use your laptop or tablet to follow lectures or answer quiz questions but not for any activities unrelated to class.
5. Your performance in this course will be improved by keeping up with the material. The knowledge you gain in this course will be critical, and non-redundant, for your success in subsequent courses, especially Pharmacotherapy.
6. Review sessions and Office hours: Students have the liberty to request a meeting with faculty on an individual basis. Please contact the professor to arrange a mutually convenient time. A few days

prior to an exam, faculty also offer review sessions at his/her discretion. During these sessions, students are welcome to ask questions. In either case, students are expected to have familiarized themselves with the material before attending. If a student experiences difficulty with basic concepts or study habits then tutors are available for free from Greg Caldera in the Student Affairs Office.

7. **Religious Holidays:** By UT Austin policy, you must notify the instructor of your pending absence at least 14 days prior to the date of observance of religious holy day. If you must miss a class, an examination, or quiz in order to observe a religious holy day, you will be given an opportunity to complete the missed work with a reasonable time after said absence.
8. **Campus Carry:** Students should familiarize themselves with the information provided by the University regarding the implementation of "Campus Carry" legislation. You will find an information sheet specifically for students (as well as sheets for parents, visitors, faculty, and staff) at <http://campuscarry.utexas.edu/info-sheets>."
9. **Emergency Preparedness:** TBD

QUIZZES and EXAMINATIONS

1. **Quizzes:** A short quiz will be administered weekly at the beginning of the class period, beginning on the second week of the semester. You will be required to use your dedicated laptop, tablet or smartphone to log into Canvas to answer quiz questions. Quizzes will cover lecture material from the previous week. There will be no make-up quizzes for students absent or late to class. At the end of the semester the one lowest score will be dropped. Quiz questions will not be subject to reconsideration requests. The average of the remaining scores will account for 20% of the semester course grade.
2. **Examination Time, Location and NOISE:** Semester exams will begin promptly at the designated hour and will last for 2 hours; the final examination will last 3 hours. Semester exams will be given 7-9 pm on the day listed in the syllabus. The exam location may change during the semester so be sure you know the correct location! Students must arrive on time for examinations. During the exams, students are required to place their bags and other belongings in the front or side of the classroom. Therefore, this environment MAY NOT be conducive to carrying a concealed weapon (<https://campuscarry.utexas.edu/>). Please be advised that it is the licensed carrier's responsibility to be compliant with the University's policies. Furthermore, students will not be allowed to take the exam if they arrive after any other student has completed the exam and left the room. In such cases, the student's exam grade will be "0%". It is not acceptable to discuss any questions in detail in the area outside the classrooms while the exams are still ongoing **WHETHER OR NOT YOU HAVE COMPLETED THE EXAM**.
3. **Advance requests for absences from examinations:** Under EXCEPTIONAL circumstances, you may request another exam time by contacting Dr. Van Den Berg **PRIOR** to the exam, and you must complete the College Form titled "Student Request for Alternate Exam Time" for consideration and final approval by Dr. Van Den Berg **PRIOR** to the exam day – preferably as soon in the semester that you know you need to request exam re-scheduling. If permission is granted, the nature of the make-up exam will be at the discretion of the course director (oral, written, increased weighting on the final, etc.).
4. **Sickness and exam absences:** No allowances will be made for an exam being missed after the fact without subsequent evidence documenting an illness or emergency that occurred immediately

prior to the time of the exam. If you become sick and unable to attend the exam, you should immediately notify Dr. Van Den Berg by email. You will be expected to take the exam as soon as possible. The nature of the make-up will be at the discretion of the Course Director (oral, written, increased weighting on the final, etc.). An unexcused absence from an exam will result in a grade of "0%" for that exam.

5. **Grading of Exams; Posting Class Scores & Keys:** Each exam will have an HONOR CODE that states, "I have neither participated in nor witnessed any acts of academic dishonesty pertaining to this assignment." If students are unable to sign this form in good consciousness, the course director will follow up to determine the reason(s). It is of utmost importance to maintain academic integrity amongst our student body.

The grading of exam questions will be based upon the scantron sheets and not on answers written on your exam papers. No re-grades based upon miskeying answers from the exam to the scantron will be allowed – therefore check and recheck your answers keyed onto your scantrons. Two points will be deducted if your student information is missing, including student name, signature, and UT EID. You must turn in your scantron and your exam with your signed (or intentionally unsigned) honor pledge prior to leaving the exam. Your scantron will be later photocopied and that photocopy will be available from the LRC desk (PHR 3.114) in 1-2 days. Once scantron copies are made available to you, the key will be posted and an announcement will be made on Canvas. Within 3-5 days of the exam, your exam grade will be posted on the Canvas gradebook and you will be notified that grades are posted.

6. **Post-Exam Remarks and Reconsideration Requests:** Only if there is a disagreement over the answer to a specific question, the student may present his/her exam plus a written explanation (with appropriate documentation) to the instructor within 72 hours of the listserv announcement of posting of the exam results & key as described above. Documentation may include statements from textbooks, handouts, packets, or current scientific reprints; lecture notes are not authoritative documentation. In your reconsideration request please restate the question and correct answer. The explanation must be clear, rational, and concise. Each student will receive one opportunity to justify his/her answer. (This policy does not apply to addition or other grading errors). See below for Dr. Davis's essay on reconsideration requests.

7. **Final Exam Re-Examination Policy:**

There is no final exam re-examination allowed in this course.

8. **Academic Dishonesty:** The "Statement on Scholastic Dishonesty of the College of Pharmacy" reads as follows:

"Pharmacy practitioners enjoy a special trust and authority based upon the profession's commitment to a code of ethical behavior in its management of client affairs. The inculcation of a sense of responsible professional behavior is a critical component of professional education, and high standards of ethical conduct are expected of pharmacy students. Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including failure of the course involved and dismissal from the college and/or the University. Since dishonesty harms the individual, fellow students, and the integrity of the University and the College of pharmacy, policies of scholastic dishonesty will be strictly enforced in this class".

Students are expected to have read and understood the current issue of the General Information Catalog published by the Registrar's Office for information about procedures and about what constitutes scholastic dishonesty. Students independently complete all examinations. All cases of cheating on examinations or quizzes will be immediately reported to the Dean of the College of Pharmacy and to the Dean of Students, as per University regulations. Administration of formal disciplinary actions will proceed by university guidelines and the course faculty will generally recommend a score of "0%" for that examination as penalty for cheating. As per university guidelines, this penalty may be modified by the Office of Student Judicial Services.

9. **Students with Disabilities:** The University of Texas at Austin provides upon request appropriate academic accommodations for qualified students with disabilities. All University rules concerning accommodations must be followed, including the student arranging for special accommodations **prior to EACH examination with Dr. Van Den Berg (Course Director)**. Please submit your accommodation paperwork to Dr. Van Den Berg at the beginning of the semester. In the absence of such **prearrangement**, the student will be assumed that the student is not requesting special accommodations for that exam, and will be expected to take the exam with the rest of the class at the regularly scheduled exam time. For more information, contact the Office of the Dean of Students at 471-6259, 471-4641 TTY.

Oath of a Pharmacist¹

"At this time, I vow to devote my professional life to the service of all humankind through the profession of pharmacy.

I will consider the welfare of humanity and relief of human suffering my primary concerns.

I will apply my knowledge, experience, and skills to the best of my ability to assure optimal drug therapy outcomes for the patients I serve.

I will keep abreast of developments and maintain professional competency in my profession of pharmacy.

I will maintain the highest principles of moral, ethical, and legal conduct.

I will embrace and advocate change in the profession of pharmacy that improves patient care.

I take these vows voluntarily with the full realization of the responsibility with which I am entrusted by the public."

COURSE GRADING AND		EXAM MATERIAL and DATES	
First exam	20%	Lecture 1-16	Tuesday, Sept 20, 2016
Second exam	20%	Lecture 17-32	Tuesday, Oct 18, 2016
Third exam	20%	Lecture 33-49	Tuesday, Nov 15, 2016
Quiz grade average	20%	Each Wednesday Class	
Comprehensive final exam	20%	Lecture 50-57 & Comprehen.	TBA
Total	100%		

¹ Developed by the American Pharmaceutical Association Academy of Students of Pharmacy/American Association of Colleges of Pharmacy Council of Deans (APhA-ASP/AACP-COD) Task Force on Professionalism; June 26, 1994 American Association of Colleges of Pharmacy 1426 Prince St. Alexandria, VA 22314 Phone: (703) 739-2330 Fax: (703) 836-8982 Email AACP

The following grade ranges will be used:

A = 93–100 %

A- = 90-92%

B+ = 87-89 %

B = 83-86 %

B- = 80-82 %

C+ = 77-79 %

C = 73-76 %

C- = 70-72 %

D+ = 67- 69 %

D = 65 - 66%

F = Below 65%

An Essay on Submitting Grade Reconsideration Requests

By Prof. Patrick J. Davis, Associate Dean

5/18/03

Definition: You are *requesting* that a faculty member *reconsider* your answer to a specific question(s) based upon additional documentation or explanation. Therefore, these are neither *challenges* nor contesting of the question; they are reconsideration *requests!*

The Approach: Since these are *requests for re-grade*, not *challenges*, it would be in your best interests to start your email professionally and with courtesy, for example:

- "I am submitting question #3 for reconsideration based upon...Thanks you for your consideration."
-or-
- "I am writing to ask that you reconsider my answer for question #3 based upon..." -but not-
- "I thought this was a dumb question!" -or-
- "I am contesting question #3. I felt that this question was not testing our knowledge of the material but our ability to memorize odd facts. I studied extremely hard for this exam and felt like I knew the material, but I did not memorize how many amino acids were in each hormone." [anonymous quote, 2003]

The Justification: As indicated in the first-day handout, any submission for reconsideration needs to include appropriate, written justification to support your request. This could include your interpretation of the material and/or information from the textbook, primary references, the faculty member's handout, etc.

1. If you believe there is a discrepancy between what two faculty members present in class (or differences between classes), this would obviously come up when the information is presented in class or when you are studying. Therefore, your concerns or confusion should be ironed out with the faculty *before* the test, *not* used as a post exam justification.

It may be that two faculty members are presenting information differently for a reason. For example, the clinician may stress that Pen G is not useful against *Staph*. From a clinical standpoint, since the *vast* majority of *Staph* strains are resistant to Pen G, then this is a very reasonable summary statement. The medicinal chemist/pharmacologist may stress that 95% are resistant, but 5% are still sensitive during the discussion of resistance development over time, *specifically* to *emphasize* where we're at in the development of penicillin resistance with this organism. *Both* of these perspectives are clearly valid in the context of what is being taught, and are not contradictory statements.

2. Rarely will you be successful in using old exams as your justification.

- "This question was very similar to question #17 from the 1999 exam, and the answer was 'D' (which is what I put)." [anonymous quote, 2003]

It could be that the question on the previous exam was thrown out because of poor statistics, and so the old exam copy you have has a 'wrong' answer for which all students were given credit. That doesn't make it correct. This is one reason why in Pharmacotherapy Ila-IIc, we post previous exams in an 'unanswered' form (for you to use for self-evaluation) and then post the keys separately.

In relying on old exams, you should also understand that the information may have changed! Consider the following question:

- “Strains of *Staphylococcus* have emerged which are clinically resistant to vancomycin.”

On the 2001 exam, this statement was *false*; on the 2002 exam it was *true*. Clearly, therapeutic guidelines change as well, which may make old exam questions equivocal or simply incorrect.

3. You may want to have a colleague read your statement for feedback before you submit it for faculty consideration. Examples:

- “In lecture, you said that side-effects included agranulocytosis, thrombocytopenia, hypoprothrombinemia, and aplastic anemia. But on the test you said blood dyscrasias so I marked it false! You never once mentioned blood dyscrasias! [anonymous quote, 2003]
- “You said ‘drug of choice’ in the question, but you didn’t ask which one is primarily the best, so I thought any drug on the list used for treatment was appropriate.” [anonymous quote, 2003]
- “On slide 17 you said ‘most hormones circulate in the blood, coming into contact with essentially all cells,’ but on the test you said ‘most hormones come into contact with all cells.’ Since the question didn’t say anything about blood, I marked it false.” [anonymous quote, 2003]

This is an interesting one. Can you imagine the uproar if this was reversed; i.e., if the faculty member counted this *wrong* for those students who marked it *true* simply because in lecture he mentioned *via the blood*, whereas on the exam, he didn’t mention blood? *The big picture* issue here is that selectivity in hormonal response is not based on cell exposure since essentially all cells are exposed to the hormone via the blood. Rather, selectivity is based on cell-specific recognition of the hormone. Apparently, the student missed this important concept.

4. Never, never, never use as your justification “I need the points”.

The decision on a reconsideration request belongs to the faculty member authoring the question, but all Course Coordinators caution their faculty to *not* consider this “justification” in *any way* in their deliberations. This is *never* an appropriate justification for awarding points, and it simply isn’t fair to the other students to make it a basis for awarding points. Should a student 1-pt from a “C” be given the points for a “B” *just because they asked for them*, while another student with the same score be assigned (and accept) a “C”? What is that faculty member to do when the second student finds out the first was awarded the points just for asking?

5. Just because you can find an article supporting your position doesn’t *automatically* mean that it is correct or that you should be given credit.

Part of the faculty member’s responsibility is to stay current with their field, which involves reading, reviewing, and distilling the often-time copious & conflicting material relevant to their field to create their learning environment and define the content they present to you in class. The faculty member will make their decision on the article/text you cite in the context of their full knowledge of the field and what they present to you in class.

6. If you feel that your reconsideration request has not been fairly considered, you have the right to appeal the decision to the Course Coordinator (consistent with the College Grievance Policy in your Student Handbook). However, you need to *fully justify* your appeal, not just forward a message to the Course Coordinator that “*You have all the emails I sent, and as you can see, the Professor did not give me the points.*”

Conclusion: Not all courses allow for the submission of reconsideration requests; the decision as to whether to do so rests with the faculty. Clearly, if this is allowed, the faculty member is committed to fully and fairly assessing your submission prior to making a decision based on the information you provide. Therefore, your submission should be well thought-out and presented in a professional manner, *and you have every right to expect* the faculty member to respond in a like manner.

Lecture hr	FALL	Date	Topic
1	Morrisett	24-Aug	Ionic basis of resting membrane potential
2	Morrisett	24-Aug	Graded Actions Potentials, Contiguous/voltage-gated ion chanr
3	Morrisett	26-Aug	Synaptic transmission, Vesicular Release of neurotransmitters i
4	Gonzales	26-Aug	Drug affinity
5	Gonzales	31-Aug	Analysis of drug-receptor interactions
6	Gonzales	31-Aug	Receptor theory/ drug efficacy
7	Gonzales	2-Sep	Drug efficacy
8	Gonzales	2-Sep	Dose-response curves, drug antagonism
9	Gonzales	7-Sep	Drug antagonism
10	Morrisett	7-Sep	Ligand-gated ion channels, G-coupled, steroid hormone and gro
11	Morrisett	9-Sep	Autonomic Nervous System – Efferent
12	Morrisett	9-Sep	Autonomic Nervous System – Efferent
13	Kidane	14-Sep	Gastrointestinal System -normal physiology, absorption/ motili
14	Kidane	14-Sep	Gastrointestinal System -normal physiology
15	Kidane	16-Sep	liver/biliary normal physiology
16	Kidane	16-Sep	Essential nutrients (carbs/fats/proteins) vitamins (essential/nor
17	Kidane	16-Sep	Upper GI disorders (GERD, PUD)
18	Kidane	21-Sep	Lower GI disorders (diarrhea, constipation, pancreatitis, pancre
19	Morrisett	21-Sep	Overview of the CNS
20	Morrisett	23-Sep	Glia, Cerebrospinal Fluid, Ventricular circulation, Blood-brain Ba
21	Morrisett	23-Sep	Cerebral Cortex, Sensory, Motor, Homonculi
22	Morrisett	28-Sep	Limbic system, synaptic plasticity
23	Morrisett	28-Sep	Proprioception /Nociception/Spinal cord
24	Morrisett	30-Sep	Vision/Auditory/Taste/Vestibular System
25	Morrisett	30-Sep	Somatic Nervous System – Efferent
26	Marinelli	5-Oct	Seizures
27	Marinelli	5-Oct	Alzheimer's and other dementias
28	Marinelli	7-Oct	Psychosis/Parkinson's
29	Marinelli	7-Oct	Mechanisms of Addiction
30	Marinelli	12-Oct	Psychosis, Parkinson's, Addiction: compare and contrast
31	Marinelli	12-Oct	Mood/Anxiety Disorders
32	Duvauche	14-Oct	Pain
33	Mills	14-Oct	Muscle Physiology
34	Mills	19-Oct	Muscle Physiology
35	Mills	19-Oct	Muscle Physiology – neuromuscular /demyelinating diseases/rf
36	Mills	21-Oct	Malignant hyperthermia, MG, ALS
37	Van Den B	21-Oct	Cardiac Physiology
38	Van Den B	26-Oct	Cardiac Physiology
39	Morrisett	26-Oct	Cardiac Electrophysiology
40	Morrisett	28-Oct	Cardiac Arrhythmias
41	Van Den B	28-Oct	Blood Vessels and Blood Pressure
42	Van Den B	2-Nov	Blood Vessels and Blood Pressure
43	Wright	2-Nov	Normal hematopoiesis

44	Wright	4-Nov	Normal hematopoiesis
45	Wright	4-Nov	Normal hematopoiesis and coagulation
46	Van Den B	9-Nov	CV Pathophysiology- hypertension
47	Van Den B	9-Nov	CV Pathophysiology- shock, aneurysms
48	Van Den B	11-Nov	CV Pathophysiology - atherosclerosis
49	Van Den B	11-Nov	CV Pathophysiology- Stroke, Embolisms
50	Van Den B	16-Nov	CV Pathophysiology- ACS/CAD
51	Van Den B	16-Nov	CV Pathophysiology CHF
52	Wright	18-Nov	Coagulation disorders (hemophilia, DIC)
53	Wright	18-Nov	Hematopoietic Disorders: Neoplasias
54	Wright	30-Nov	Hematopoietic Disorders: RBC, WBC, platelet Deficiencies
55	Wright	30-Nov	Anemias: iron, VitB12 and sickle cell
56	DiGi	2-Dec	Skin
57	DiGi	2-Dec	Skin (cancer, psoriasis, drug reactions, acne)