

PHRD 4012: Pathophysiology I - 41560

I. Contact Information

Course Coordinator

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II. Course Prerequisites/Co-requisites

Acceptance into the COP and enrollment

III. Course Description

Pathophysiology I (3 Cr) : This is a first year level course where students will be introduced to disease processes at a cellular, organ and system level. The course will serve as an introduction to pathophysiology building on the anatomy and physiology courses that students have already completed. The complete organ systems as well as their pathophysiologic impact disease states will be studied

This course is a major requirement for the Pharm.D. degree in pharmacy. Completion of degree requirements leads to eligibility for professional licensure and/or certification in Louisiana upon graduation. Federal Regulations require universities to provide information to students about the alignment between Louisiana's requirements and those of other states. ULM has created a web page with discipline-specific information containing hyperlinks to Licensure Boards in the United States <https://www.ulm.edu/professional-licensure-disclosures/index.html>. Program Directors and/or faculty will discuss this information with you during advising or other program meetings but is also available to answer questions and address any concerns you might have. It is also important to note that licensure or certification requirements are subject to change. Although ULM Program Directors annually review and update licensure information for every state, the faculty recommends that before enrolling in a program and throughout enrollment, students communicate with the applicable state board to confirm understanding and whether upon completion of ULM's program, they will meet requirements.

IV. Curricular Objectives and Outcomes

Domain 1 – Foundational knowledge

CAPE

1.1. Learner (Learner) - Develop, integrate, and apply knowledge from the foundational sciences (i.e., pharmaceutical, social/behavioral/administrative, and clinical sciences) to evaluate the scientific literature, explain drug action, solve therapeutic problems, and advance population health and patient centered care.

ACPE APPENDIX 1

Pathology/Pathophysiology

Basic principles, mechanisms, functional changes and metabolic sequelae of human disease impacting cells, organs, and systems.

Human Physiology

Homeostatic function and normal response reactions across the lifespan of non-diseased human cells, organs, and systems.

V. Course Specific Objectives and Outcomes

- To introduce students to common diseases.
- Students should be able to predict physiological reactions to numerous challenges at cellular level.
- Students should be able to utilize information to explain the pathological basis of diseases.
- Students should be able to define medical terminology as it applies to common disease states.
- Students should be able to relate signs and symptoms of disease to pathophysiologic process.

- Students should be able to identify the role of common drug targets in the pathophysiology of health conditions.

V. Course Topics

Ionic basis for resting membrane potential and action potentials
Voltage gated ion channels and Synaptic transmission
Autonomic nervous system
Overview of Structure/function of the central nervous system/cerebral cortex/Limbic system
Somatic nervous system
Seizures
Pain/Nociception
Affect disorders/psychosis
Parkinson's Alzheimer's
Addiction
Muscle physiology/Neuromuscular junction; skeletal muscle; neuromuscular junction disorders
Structure/function of the hematologic system
Hematopoiesis and hematopoietic Disorders
Anemias
GI physiology/Pathophysiology, liver/biliary systems
Nutrition, essential macro(carbs/fat/protein) and micro (vitamins nutrients) Nutrients
Upper (GERD, PUD) and Lower (diarrhea, constipation) GI
Cardiac pathophysiology/Electrophysiology, Cardiac Arrhythmias, Peripheral Circulation/Blood Pressure, hypertension, CV Shock, Aneurysms, atherosclerosis, stroke/Embolisms, Coronary Ischemia and Heart Disease
Iron/VitB12/Sickle Cell Anemias, Coagulation and Coagulation disorders
Structure/function of the integumentary system (Skin anatomy and physiology)
Skin Pathophysiology (skin cancers, inflammation e.g. psoriasis, acne, dermatitis)

VI. Instructional Methods and Activities

Instructional methods will be traditional lecture format. Lecture notes will be posted online prior to each class. Students should review notes and all assigned reading prior to each class. In addition to lectures, various active learning exercises will be used intermittently to reinforce lecture material and may include role-playing, in-class discussion, group discussions/projects, problem-based-learning, and demonstrations.

VII. Evaluation and Grade Assignment

- a. There will be 3 midterm exams (100 points per exam) and a final exam (100 points) for a total of 400 points. Each 50-minute class period will be represented by 10 points on the exam. The final exam will not be comprehensive. Students can also earn up to 5 bonus points from the Boot Camp Pathophysiology Exam. A time limit of fifty-five minutes will be allow for each exam, including the final exam. All exams are weighted equally and therefore treated the same.
- b. Exam dates are scheduled in the course syllabus and will only be changed as per College of Pharmacy policy or in the event of University closure.
- c. Exams may be multiple choice, fill in the blank, short-answer, case or scenario based discussion, essay, or any other format deemed necessary by the lecturers and course coordinator.
- d. Normal laboratory values will be provided for all questions, unless otherwise specified during class.

e. Lab values that are specific to a particular disease state will not be provided.

f. Information acquired from previous lectures in the course and from other courses in the professional pharmacy curriculum may be needed in preparing for these examinations.

g. Exams may cover material (readings, outside assignments) not covered in class.

h. Exams will NOT be returned to the student. All instructors will have copies of the exam and students' results, and students may view their exam results in instructors' offices, at times convenient for all involved. (See below) Review sessions may be scheduled for students to review the exam with the test question writer.

Exams will be issued using Exam Soft; all students are required to download the exams prior to the date of the scheduled exam. If a student cannot take the exam on the scheduled date the student must reverse download the exam to Exam Soft. Under no circumstances should a student open an examination, except during the scheduled time and at the scheduled location. Scratch paper will be issued on the day of the exam and all students are required to sign the scratch paper and return it to the exam proctor prior to leaving the room. No other paper items will be allowed during the exam unless supplied by the faculty administering the exam. All exams must be uploaded before leaving the classroom; in the event of a power outage or loss of Wi-Fi connection all students are required to upload the exam at the earliest possible reconnection time, however proof of exam closeout will be required prior to leaving the classroom.

Students wishing to review their exams with the course coordinators or with a specific faculty member must do so within 2 weeks of when the exam scores are posted, or within 1 week of the time that the score for the final exam is posted.

i. The use of programmable calculators and electronic devices capable of storing, receiving or transmitting data are prohibited during an exam or quiz unless expressly authorized by the course instructor. Such devices must be turned off and left with your belongings in the front of the room.

j. Students wishing to review their exams with the course coordinator or with a specific lecturer must do so *within 2 weeks* of when the test scores are posted.

k. Students wishing to challenge a question on the test must provide the course coordinator with a written statement that identifies which question(s) being challenged, why the student feels his or her answer(s) is/are correct and references from recent (published within the last 1-2 years) primary or tertiary literature to support the claim. Problems or issues with a question should be first directed, via e-mail, to the person who wrote it. The course coordinator(s) should be copied on this email, but it is the responsibility of the question's author to address the concern(s). If the student is unsure which faculty member wrote a specific question, then he or she may ask the course coordinator. In the written challenge, the student is expected to include references or rationale to support their challenge of the question. The challenge will be reviewed by the faculty member, and his or her decision will be shared with the course coordinator(s). Discussion of a dispute will occur only after the written query is submitted. Challenges of test questions for the first 4 exams will only be considered within 2 weeks of when the test scores are posted. For the final examination, challenges of test questions will only be considered within 1 week of the time that the scores are posted.

l. In the event that a determination is made that there is a legitimate issue with a particular test question, adjustments to scores will be made based on discussions between the test question writer and the course coordinator.

m. Professional student mid-term grades will be posted on-line for students to view via Banner. Mid-term grades indicate a student's status at mid-semester only and do not indicate the final performance outcome of a student. Late assignments will only be accepted with an excused absence.

n. "Students scoring <70% on any exam and an overall exam average <70% (excludes quizzes, assignments, bonus, etc.) will be required to submit to the coordinator written, narrative responses to select lecture objectives that will be provided within 24 hours of the posting of their exam grade to Moodle. These objectives will be in the form of a Moodle assignment and represent unit--- or lecture---level objectives to be tested upon in the next scheduled course exam.

Written responses must be submitted no later than one calendar week before the next scheduled exam. Responses must be written in complete sentences and may not be copied or pasted from any source, including class notes, treatment guidelines, textbooks, or any internet site. Submissions found to contain responses that have not been written in a student's own words will be considered a failure to submit.

In addition, students will be required to review each failed exam's ExamSoft---generated missed item report with the course coordinator or instructor responsible for each section of material. The discussion should include the student's reasoning for the incorrect answer as well as the reason for the correct answer.

In addition to answering objectives as described above and reviewing missed item reports, first professional year students scoring <70% on any exam and having an overall exam average <70% (excludes quizzes, assignments, bonus, etc.) will meet with the Director of Professional Affairs.

Failure to submit this required assignment will result in ineligibility to remediate."

IX. Grading Scale:

89.5 – 100%	A
79.5 – 89.4%	B
69.5 – 79.4%	C
59.5 – 69.4%	D
≤ 59.4%	F

Student Success Policy:

<http://www.ulm.edu/pharmacy/documents/ospa/earlyintervention.pdf>

Remediation Policy: <http://www.ulm.edu/pharmacy/documents/ospa/remediationpolicy.pdf>

X. Class Policies and Procedures

At a minimum, all policies stated in the current ULM Student Policy Manual & Organizational Handbook should be followed (see <http://www.ulm.edu/studentpolicy/>). Additional class policies include:

Early Intervention Policy You are required to read, understand and follow the Early Intervention Policy <http://www.ulm.edu/pharmacy/documents/ospa/earlyintervention>.

A. Textbooks (required):

1. *Pathophysiology-The Biologic Basis for Disease in Adults and Children*, 8th edition. Edited by Kathryn L. McCance and Sue E. Heuther. Mosby Publishing.

2. *Pathophysiology of Disease: An Introduction to Clinical Medicine*, 8th edition. Edited by Gary D. Hammer, MD, PhD, and Stephen J. McPhee, MD. Lange Publishing.

3. *Ganong's Review of Medical Physiology*, 26 edition. Edited by Kim E. Barrett, Susan M. Barman, Scott Boitano, Heddwen L. Lange Publishing.

B. Attendance Policy: Class attendance is regarded as an obligation as well as a privilege, and students are expected to know attendance regulations and to attend regularly and punctually at classes in which they are enrolled. Failure to do so may: (1) prevent access to the classroom during regularly scheduled times; (2) jeopardize a student's scholastic standing; and (3) lead to suspension from the School or University. Students must submit excuses for class absences to course coordinators within three class days after returning to classes.

This course will follow the University's attendance policy which can be found at the following link:

<http://catalog.ulm.edu/content.php?catoid=23&navoid=2875&hl=attendance&returnto=search#Class Attendance Regulations Excused Absences>

Professors shall accept an official University excuse. With the following exceptions, professors are to determine whether absences are excused or unexcused: 1) Absences arising from authorized trips away from the University or from special duties at the University shall be excused. 2) Absences arising from a student's confinement in a hospital or other in-patient facility or doctor's excused absences shall be excused. Students are responsible for verifying this information to the faculty. 3) Absences arising from a death in the immediate family shall be excused. The immediate family is defined as spouse, child, step-child, mother, father, sister, brother, grandmother, grandfather, step-mother, step-father, step-brother, step-sister, aunt, uncle, mother-in-law or father-in-law.

C. Make-up Policy: Each student is expected to attend each exam at the date and time specified. If a student cannot attend an exam due to a valid University excuse, he/she must speak directly with the course coordinator, as soon as possible. The course coordinator must be notified prior to the examination, if at all possible, if a student anticipates being unable to attend the exam. Failure to attend a scheduled make-up exam will result in a zero (0) grade for that exam. Make-up exams will be prepared at the same or higher level than the original exam. The format of the make-up exam may be written or oral. *Students missing an exam due to a University approved excuse will take the make-up exam during the week of finals, or as determined by the course coordinator.*

<http://www.ulm.edu/pharmacy/documents/ospa/excusedabsence.pdf>

D. Academic Integrity: Students must observe the ULM published policy on academic dishonesty (See page 4 in the ULM *Student Policy Manual*: <http://www.ulm.edu/studentpolicy/>). In addition, students must observe the ULM School of Pharmacy Code of Ethical and Professional Conduct (<http://www.ulm.edu/pharmacy/documents/ospa/codeofconductv82011.pdf>) and the Dress Code (<http://rxweb.ulm.edu/pharmacy/studentinfo/default.html>).

E. Course Evaluation Policy: At a minimum, students are expected to complete the on-line course evaluation as well as any evaluation administered in class by the School of Pharmacy.

F. Student Services: The University of Louisiana at Monroe strives to serve students with special needs through compliance with Sections 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act. These laws mandate that postsecondary institutions provide equal access to programs and services for students with disabilities without creating changes to the essential elements of the curriculum. While students with special needs are expected to meet our institution's academic standards, they are given the opportunity to fulfill learner outcomes in alternative ways. Examples of accommodations may include, but are not limited to, testing accommodations (oral testing, extended time for exams), interpreters,

relocation of inaccessible classrooms, permission to audiotape lectures, note-taking assistance, and course substitutions. Information concerning student services in the School of Pharmacy can be found in the School of Pharmacy Student Handbook. In particular, students should pay special attention to the University's technical standards and policies concerning students with special needs (<http://www.ulm.edu/studentpolicy/studentpolicy.pdf>). ULM student services, such as the Student Success Center (<http://ulm.edu/cass/>), Counseling Center (<http://ulm.edu/counselingcenter/>), and Student Health Services, is available at the following Student Services web site <http://ulm.edu/studentaffairs/>. Students with special needs requiring accommodations MUST follow the process described at <http://rxweb.ulm.edu/pharmacy/student/specialneeds.pdf>.

Information about ULM student services can be found via these links:

If you are having problems with emotional, social, and/or behavioral issues please call any of the mental health clinics on the ULM campus to make an appointment. All services are free to ULM students, staff, and faculty, and are strictly confidential.

- SOP Office of Student and Professional Affairs: 342-3800
- ULM Counseling Center: 342-5220
- Marriage and Family Therapy Clinic: 342-5678
- Community Counseling Center: 342-1263
- ULM HELPS (Helping Educators and Learners Prevent Suicide) Project Office: 342-1335

Remember that all services are offered free to students, and all are strictly confidential.

If you have special needs that I need to be made aware of, you should contact me within the first two days of class.

Sexual Harassment or Gender-Based Discrimination

Title IX of the Education Amendments of 1972 prohibits sex discrimination against any participant in an educational program or activity that receives federal funds, including federal loans and grants. Furthermore, Title IX prohibits sex discrimination to include sexual misconduct, sexual violence, sexual harassment and retaliation. If you encounter sexual harassment or gender-based discrimination, please contact the Title IX Coordinator at 318-342-1004; you may also file a complaint online, 24 hours a day, at: www.ulm.edu/titleix.

G. Emergency Procedures: Please review the emergency escape plan in the classrooms and hallways of the Bienville building. Move quickly in an orderly manner to the appropriate stairwell and exit the building. The meeting place for this class will be the far end of the north parking lot between Bienville and Broadmoor Blvd. Under no circumstances is the elevator to be used for emergency evacuation. Any student needing assistance should notify the professor immediately. For emergencies, to contact University Police, call **1-911** from landlines and **342-5350** from cell phones.

Health and Safety Requirements (for Face-To-Face and Hybrid Courses)

In order to safeguard the health and safety of students, faculty, and staff during the COVID-19 pandemic, the University has had to institute a variety of different protocols in response to State of Louisiana and University of Louisiana System mandates during the different phases of reopening. All students are expected to be in compliance with these required policies and procedures. This means that students will need to wear face masks, practice social distancing, and follow other requirements inside all campus buildings and while attending classes until such time as State and University authorities no longer mandate them. As we continue to pursue learning

during this unprecedented health crisis, please remember that you are being required to do these things to protect others and to show concern for their welfare; you should expect the same consideration in return.

Emergency Remote Instruction (for Face-To-Face and Hybrid Courses)

During the semester, campus operations might be disrupted by an emergency, such as a tornado, fire, or pandemic. If in-person instruction becomes impossible for a period of time, the class will enter a phase of emergency remote instruction (ERI). During this phase, instruction will take place via virtual means, either synchronously or asynchronously. Your instructor will alert you when this happens via e-mail and will include a description of how the course will proceed.

Technical Requirements During ERI (for Face-To-Face Courses)

During a period of emergency remote instruction, the need for the course to continue in a virtual manner means that you will be required to have appropriate equipment, software, and telecommunication access to allow you to participate. This course will require that you have the following, should we have to go into ERI:

[Zoom meetings currently established for the class will be use synchronously]

Technical Requirements (for Hybrid and Online Courses)

The normal delivery method for this course requires instructional materials and interactions remotely. Because of this, all students will be expected to have the appropriate equipment, software, and telecommunication access. For this course, these are you laptop computer and associated software (zoom, examsoft, etc).

[Instructor inserts needed equipment, software, and access here]

COVID-19 Symptoms and Testing (for Face-To-Face and Hybrid Courses)

The COVID-19 pandemic has disrupted every aspect of daily life. Returning from the nationwide shutdown in the spring of 2020 continues to involve a phased approach within which various protocols and procedures for handling the virus and its rates of infection are established. One aspect of this is testing and contact tracing for those individuals who develop symptoms of COVID-19. Information on what you are required to do should you develop symptoms or test positive for COVID-19 can be found in the COP COVID-19 playbook or ULM website below:

https://www.ulm.edu/safety/student_positive_test/index.html

In the event that one or more individuals in a course are diagnosed with COVID-19, contact tracing will be done to determine the potential exposure to other individuals in the class. One potential outcome of this tracing might be a recommendation that the members of the class quarantine for a period of time. If this happens, the course will go into emergency remote instruction during that time period. The procedures for this are explained elsewhere in the COP COVID-19 playbook.

Federal Regulations require *determination and verification of every students' physical location while enrolled in classes (where they are physically located while taking classes), regardless of the delivery method (on campus, online). At the beginning of every semester and whenever physical location changes, students must update or verify their current location through banner https://ssb-prod.ec.ulm.edu/PROD/bwggkogad.P_SelectAtypUpdate. Students should do this by the end of the first week of classes.*

The course coordinators reserve the right to adjust the syllabus or schedule, in accordance with University and School policies and procedures.

IX. Course Schedule PHRD 4012: Pathophysiology I:**Fall 2021****Class will meet in Bienville 340 on the following days and times:**

Tuesday	9:00am – 9:50am
Thursday	9:00am – 9:50am
Friday	9:00am – 9:50am

Week 1

Tuesday 8/17	Ionic basis of resting membrane potential; Action Potentials (Sylvester)
Thursday 8/19	Voltage gated ion channels, Synaptic transmission (Sylvester)
Friday 8/20	Autonomic Nervous System (Sylvester)

Week 2

Tuesday 8/24	Autonomic Nervous System (Sylvester)
Thursday 8/26	Overview of Central Nervous System (Briski)
Friday 8/27	Cerebral Cortex/Limbic System (Briski)

Week 3

Tuesday 8/31	Proprioception/Spinal Cord (Briski)
Thursday 9/2	Temperature Regulation (Briski)
Friday 9/3	Somatic Nervous System (Briski)

Week 4

Tuesday 9/7	Seizures (Sylvester)
Thursday 9/9	EXAM I (8/17 through 9/7)
Friday 9/10	Pain/Nociception (Sylvester)

Week 5

Tuesday 9/14	Affect Disorders/Psychosis (Sylvester)
Thursday 9/16	Parkinson's/Alzheimers (Sylvester)
Friday 9/17	Addiction (Sylvester)

Week 6

Tuesday 9/21	Muscle Physiology (Briski)
Thursday 9/23	Neuromuscular/Demyelination Diseases (Briski)
Friday 9/24	Hematopoiesis (Chamcheu)

Week 7

Tuesday 9/28	Hematopoietic Disorders (Chamcheu)
Thursday 9/30	Anemias (Chamcheu)
Friday 10/1	Gastrointestinal physiology (Liu)

Week 8

Tuesday 10/5	Liver/biliary (Liu)
Thursday 10/7	Essential macro (carbs/fat/protein) and mic (vitamins nutrients) (Liu)
Friday 10/8	Exam II (9/10 through 10/1)

Week 9

Tuesday 10/12	Upper (GERD, PUD) and Lower (diarrhea, constipation) GI (Liu)
Thursday 10/14	Upper (GERD, PUD) and Lower (diarrhea, constipation) GI (Liu)
Friday 10/15	Cardiac Physiology (Jackson)

Week 10

Tuesday 10/19	Cardiac Physiology/Electrophysiology (Jackson)
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