

I. Contact Information

Course Coordinator/Instructor-of-Record:

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School of Pharmaceutical and Toxicological Sciences
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Office Hours: 9 pm – 11.30 pm: Mon. - Thur.

II. Course Prerequisites/Co-requisites

Acceptance into the first year at the COP and registration

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 pharmacy degree Pharm.D. 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. Course Objectives and Curricular Outcomes

To provide an adequate foundation of understanding of common disease states, to enable students to:

- predict physiological reactions to numerous challenges at cellular level.
- utilize information to explain the pathological basis of diseases.
- define medical terminology as it applies to common disease states.
- relate signs and symptoms of disease to pathophysiologic process.
- identify the role of common drug targets in the pathophysiology of health conditions.

Educational (based on CAPE outcomes)

Domain 1 – Foundational knowledge

1.1. Learner (Learner) - Develop, integrate, and apply knowledge from the foundational sciences (i.e., physiological, pathophysiological, 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.

Domain 3 - Approach to Practice and Care

3.1. Problem Solving (Problem Solver) – Identify problems; explore and prioritize potential strategies; and design, implement, and evaluate a viable solution.

ACPE APPENDIX 1 (required elements)

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 Topics

- Ionic basis for resting membrane potential and action potentials; Voltage gated ion channels and synaptic transmission; Autonomic nervous system structure and function
 - Overview of Structure/function of the central nervous system/cerebral cortex/limbic system;
- Somatic nervous system
- Seizures; Pain/Nociception
 - Affective disorders/psychosis; Parkinson's disease; Alzheimer's diseases; Addiction
 - Muscle physiology/neuromuscular junction; skeletal muscle; neuromuscular junction disorders
 - Hematologic systems: structure/function and hematopoiesis; 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, genetic skin disorders, 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 before 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. Assignments submitted past the due date/time will only be accepted with an excused absence.

VII. Evaluation and Grade Assignment

- Student knowledge and understanding of course material will be assessed by administration of four 100-point unit examinations; there will thus be a total of 400 earnable points toward the final grade. Exam 4 will be scheduled during fall semester final exam week. Students are eligible to earn bonus points from the Boot Camp Pathophysiology Exam. All examinations will be weighted equally.
 - Exam dates are listed in the course syllabus, under Tentative Lecture Schedule, and are subject to change per College of Pharmacy policy or in the event of University closure.
 - Exam questions may be written as follows: multiple choice, fill in the blank, short-answer, case or scenario-based discussion, essay, or another format deemed appropriate by course faculty.
 - Normal laboratory values will be provided for all questions, unless otherwise specified during class. Lab values that are specific to a particular disease state will not be provided.
 - Exams may cover material from assigned readings and other assignments not covered in class.
 - Exams will be administered using ExamSoft; 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, he/she must reverse download the exam to ExamSoft. Under no circumstances should a student open an examination other than during the scheduled time at the scheduled exam location. No paper items will be allowed during the exam unless supplied, i.e. scratch paper, by faculty. 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.
 - Use of programmable calculators and electronic devices capable of storing, receiving or transmitting data is prohibited during any examination or quiz, unless explicitly authorized by the instructor. Such devices must be left in the off-position with the remainder of personal belongings at a designated location in the classroom.
 - Exams will NOT be returned to the student. Students will have the opportunity to review their exam results with individual instructors, by arrangement, and must do so *within two weeks* after examination grades are posted or within one week after final exam grades are released.
 - A student who wishes to challenge an exam question must provide the course coordinator with a written statement (email or hard copy) that identifies which question(s) being challenged, describes why the student feels his or her answer(s) is/are correct, and provides references from recent (published within the last 1-2 years) literature to support his/her claim. Discussion of a dispute will occur only after the written query is submitted. Challenges of test/exam questions will only be considered within two weeks after test scores are released. For the final examination, challenges of test questions will only be considered within one week after release of test scores. If there is a conflict between lecture notes versus textbook or other reference material, precedence will be given to the lecture notes.
 - Actions to be taken in the event that a test question is determined to be flawed will be established by discussion involving the question author and the course coordinator.

Available Points per Exam and Total Course Points:

Exam 1: 100 points	}	Total Earnable Points: 400 points
Exam 2: 100 points		
Exam 3: 100 points		
Exam 4: 100 points		

IX. Grading Scale for Final Course Grade as Determined by Total Earned Points:

360 – 400 total points	A
320 – 359 total points	B
280 – 319 total point	C
240 – 279 total points	D
≤ 239 total points	F

A final course grade was be based upon point earned points; no final grade will deviate from the above scale. Mid-term grades will be posted in Canvas for on-line viewing. Mid-term grades indicate cumulative performance at mid-semester only, and thus do not constitute the final course grade.

X. Early Intervention

Students earning a grade of less than 70 on any exam and an overall exam score average of less than 70% (excluding quizzes, assignments, bonus, etc.) will be required to submit prior to the next exam written, narrative responses to lecture objectives of instructors covering material on that upcoming examination. Lecture objectives will be provided within 24 hours of the posting of the previous exam grades. These objectives will constitute unit- or lecture-level learning expectations that will be assessed on the next scheduled course exam.

Written responses to lecture objectives *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 the student's own words will be considered a failure to submit.

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

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

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

XI. Remediation Policy

1. Rationale/context to policy:

- Remediation is a sequence of events beyond the standard course curriculum that is designed to bring underperforming students to the expected level of competency at the conclusion of a course. The process of remediation should provide opportunities for students to develop and demonstrate required knowledge, skills, and/or attitudes through self-directed learning and purposeful interactions with faculty. Students and faculty should both be active participants in the remediation process; however, remediation is a privilege that should be earned by the student through demonstrated attendance and active participation throughout the course.

- Within the School, the current progression standard states that students who do not earn a minimum grade of "C" in a professional pharmacy course are not permitted to progress to subsequent courses for which it is a prerequisite. In the event that a student fails to obtain a grade of "C" or better in a required professional pharmacy course, the student will have the option to either repeat the course or remediate.

2. Policy Statement:

- Remediation is a privilege that must be earned through documented attendance and active participation throughout the semester that the non-progressing grade was earned.

- To be eligible for remediation, the student must have completed all assigned course work. If more than 7% of enrolled students in a class fail to achieve a passing grade of "C", all students earning a failing grade are eligible for remediation provided that they have fulfilled all Early Intervention program requirements, as outlined above. Remediation will be offered to any student earning a course average of $\geq 65\%$ regardless of the total number of students failing.

- If a remediating student fails to earn a minimum score of 70% on remediation assessment, the original earned grade of less and "C" will be reinstated; the student then has the option of re-enrolling in the course, provided he/she is eligible based on school progression policies. Two consecutive "F" grades in a single course will result in dismissal of the student from the program.

- Students will be allowed to engage in course remediation no more than three (3) times over P1-P3 years of enrollment. Students may not remediate a single class more than once. There will be no make-up exams in the remediation.

- Students with a grade of "C" or better are not eligible to use remediation in an attempt to improve their grade in that course.

- Students receiving a non-progressing grade as a result of a disciplinary action are not eligible to remediate that course in that semester.

3. Procedures:

- Remediation will take place during Winter Break for the fall semester and during Maymester for the spring semester. A targeted final of a format to be determined by the course coordinator and instructors will be administered prior to the June "I" removal date for spring semester and prior to the February date for the fall semester.

- Required characteristics of the remediation process for all courses shall include the following:
 - Remediation assessment will be targeted to cover material on each exam on which the student earned a score of less than 70%.

- Students will be instructed to view recorded lectures, which will be made available for each lecture over the course of the semester and are archived for one year after the course completion.

- Students will demonstrate achievement of all or specifically assigned lecture objectives by completing narrative responses in their own words. Copying and pasting from any source (including instructor-provided resources, such as slides) will forfeit a student's right to remediate. These responses will be submitted at least three days before the scheduled remediation exam.

- Students must schedule a time to contact the instructors with their questions or to seek feedback on their submission.

- Course coordinators may make modifications to the process, after consultation with Associate Dean of Academic Affairs.

- Prior to offering remediation, the course coordinator must contact the Director of Professional Affairs with a list of names for potential remediation. The Director of Professional Affairs will inform the course coordinator of the student's eligibility for remediation.

XII. 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 as described above. You are required to read, understand and follow the Early Intervention Policy

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

A. Textbooks (required):

- *Pathophysiology-The Biologic Basis for Disease in Adults and Children*, 9th edition. Edited by Kathryn L. McCance and Sue E. Heuther. Mosby Publishing.
- *Pathophysiology of Disease: An Introduction to Clinical Medicine*, 8th edition. Edited by Gary D. Hammer, MD, PhD, and Stephen J. McPhee, MD. Lange Publishing.
- *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 and a privilege; students are expected to know attendance regulations and to attend regularly and punctually at classes in which they are enrolled. Students are required to be in class on time, according to the published class schedule. A student entering the classroom after the scheduled starting time will be considered absent. Students must submit excuses for class absences to course coordinators within three class days after returning to classes.

This course and the College of Pharmacy follows the University 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 and verifiable University excuse, he/she is required 1) in advance to call the Office of Student and Professional Affairs and 2) to 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. Exams will not be given early. 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> In the event that the final exam is missed, for reasons stated below, a grade of "I" will be assigned and the student will follow the University policy for adjusting the "I" grade. In the case that an exam is missed, the student must follow and adhere to the time frame in the College of Pharmacy's excused absence policy.

Acceptable excuses will include, but not be limited to:

- Medical or dental care – validated by the attending physician or dentist. The student will present a statement from the attending health care provider indicating the date and time of treatment, the nature of the treatment and a statement that he/she was not able to take the examination at the appointed time.
- A death in the student's immediate family.
- A family emergency
- An official university function. It is the student's responsibility to have the faculty in charge of the function notify the course coordinator prior to the function.

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 College 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>).

Academic dishonesty will result in a referral to the Academic Standards and Ethics Committee. If the student is found guilty of Ethical and Professional misconduct by the committee, they will receive a zero for the assigned points (graded assignment or test) and up to an "F" in the course from the course coordinator in addition to any disciplinary action recommended by the Academic Standards and Ethics Committee. Academic dishonesty includes, but is not limited to, the use of information taken from others' work or ideas, the provision of help to others on non-collaborative evaluations (tests, quizzes, ec.), collaboration on take home exams, or the use of unapproved information or electronic devices to assist in

obtaining answers.

Unless expressly allowed by the instructor, the use of artificial intelligence (AI) tools and applications, (including ChatGPT, DALL-E, and others) to produce content for course assignments and assessments is a violation of the ULM College of Pharmacy's Code of Conduct and is prohibited.

E. Course Evaluation Policy: At a minimum, students are expected to complete the on-line course evaluation and any evaluations administered in class by the College 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 College of Pharmacy can be found in the college 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>). Information about ULM student services, such as Student Success Center (<http://www.ulm.edu/cass/>), Counseling Center (<http://www.ulm.edu/counselingcenter/>), Special Needs (<http://www.ulm.edu/counselingcenter/special.htm>), and Student Health Services, is available at the following Student Services web site <http://www.ulm.edu/studentaffairs/>.

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.

H. Discipline/Course Specific Policies: Students are responsible for all course information on Moodle and/or instructor websites. They are expected to check these sources regularly to access class materials, required readings, assignments, and other information necessary to excel in this course. Lecture notes might be posted on Moodle. Posting time; however, is at the discretion of the course coordinator. Lecture notes are not intended to be the entire content of the course. They do not take the place of class attendance, personal note-taking, and reading the assigned and/or required text. Course coordinator may revise the notes at any time during the course.

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

Student Success Center:

<http://www.ulm.edu/studentsuccess/> Counseling Center
<http://www.ulm.edu/counselingcenter/> Special Needs at
<http://www.ulm.edu/studentaffairs/>

Library <http://www.ulm.edu/library/reference.html/>

Computing Center Help Desk <http://www.ulm.edu/computingcenter/helpdesk/>

Current university policies on serving students with disabilities can be obtained on the ULM website:
<http://ulm.edu/counselingcenter/>

If you need accommodation because of a known or suspected disability, you should contact the Director for Disabled Student Services at:

Voice phone: 318-342-5220

Fax: 318-342-5228

Walk in at ULM Counseling Center, 1140 University Avenue (this building and room are handicapped accessible)

Mental Wellness on the ULM Campus:

If you are having any emotional, behavioral, or social problems and would like to talk with a caring, concerned professional, please call one of the following numbers:

ULM Counseling Center: 318-342-5220; Marriage and Family Therapy Clinic: 318- 342-9797;

Community Counseling Center: 318-342-1263

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

If you have special needs that the course coordinator needs to be aware of, please communicate those needs 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

Tentative Lecture Schedule

Class will meet in Bienville 340 on the following days and times:

Tuesday: 9:00 – 9:50 a.m.; Thursday: 9:00 – 9:50 a.m.; Friday: 9:00 – 9:50 a.m.

***Course coordinator/instructors reserve the right to change the following schedule, including lecture order and topic content, in accordance with University and School policies and procedures, as needed.**

Day	Date	Lecture	Topic	Instructor
Tu	27-Aug	1	Ionic basis of resting membrane potential; Action Potentials	Dr. Sylvester
Thu	29-Aug	2	Voltage gated ion channels, Synaptic transmission	Dr. Sylvester
Fri	30-Aug	3	Autonomic Nervous System	Dr. Sylvester
Tu	3-Sept	4	Autonomic Nervous System	Dr. Sylvester
Thu	5-Sept	5	Overview of Central Nervous System	Dr. Briski
Fri	6-Sept	6	Somatic Nervous System	Dr. Briski
Tu	10-Sept	7	Spinal Cord	Dr. Briski
Th	12-Sept	8	Cranial Nerves/Cerebral Cortex/Limbic System	Dr. Briski
Fri	13-Sept	9	Temperature Regulation	Dr. Briski
Tu	17-Sept	10	Seizure	Dr. Sylvester
Th	19-Sept		Exam 1 (Lectures 1-9) – 100 pts	
Fri	20-Sept	11	Pain/ nociception	Dr. Sylvester

Tu	24-Sept	12	Affect Disorders/Psychosis	Dr. Sylvester
Th	26-Sept	13	Parkinson's/Alzheimer's	Dr. Sylvester
Fri	27-Sept	14	Addiction	Dr. Sylvester
Tu	1-Oct	15	Muscle Physiology	Dr. Briski
Th	3-Oct	16	Neuromuscular/Demyelination Diseases	Dr. Briski
Fri	4-Oct	17	Hematologic systems/Hematopoiesis	Dr. Barabutis
Tu	8-Oct	18	Hematopoietic Disorders	Dr. Barabutis
Th	10-Oct	19	Anemias I	Dr. Barabutis
Fri	11-Oct	20	Gastrointestinal physiology	Dr. Liu
Tu	15-Oct		Exam 2 (Lectures 10-18) – 100 pts	
Th	17-Oct		Fall Break	
Fri	18-Oct		Fall Break	
Tu	22-Oct	21	Liver/biliary system	Dr. Liu
Th	24-Oct	22	Essential macro (carbs/fat/protein) and mic (vitamins nutrients)	Dr. Liu
Fri	25-Oct	23	Upper (GERD, PUD) and Lower (diarrhea, constipation) GI	Dr. Liu
Tu	29-Oct	24	Cardiac Physiology	Dr. Jackson
Th	31-Oct	25	Cardiac Physiology/Electrophysiology	Dr. Jackson
Fri	1-Oct	26	Cardiac Arrhythmias	Dr. Jackson
Tu	5-Oct	28	Peripheral Circulation/Blood Pressure	Dr. Jackson
Th	7-Nov	29	Hypertension/ CV Shock,	Dr. Jackson
Fri	8-Nov		Exam 3 (Lectures 19-28) – 100 pts	
Tu	12-Nov	30	Aneurysms/ Atherosclerosis	Dr. Jackson
Tu	14-Nov	31	Stroke/Embolisms	Dr. Jackson
Fri	15-Nov	32	Coronary Ischemia and Heart Disease	Dr. Jackson
Tu	19-Nov	33	Iron/VitB12/Sickle Cell Anemias II	Dr. Liu
Th	21-Nov	34	Coagulation/Coagulation disorders	Dr. Liu
Fri	22-Nov	35	Skin anatomy, physiology and lesions	Dr. Briski
Tu	26-Nov	36	Introduction to skin cancer (melanoma and non-melanoma),	Dr. Briski
Th	28-Nov		Thanksgiving Break	
Fri	29-Nov		Thanksgiving Break	
Tu	3-Nov	37	Introduction to skin inflammation (acne, psoriasis, and dermatitis)	Dr. Briski
	TBD		Exam 4 (Lectures 29-37) – 100 pts	