DRUG INFORMATION RETRIEVAL
PHRD 4033

I. Contact Information

Course Coordinator:
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II.   Course Pre-requisites/Co-requisites
Current Pharmacy Enrollment Standing

III.   Course Description
3 cr. This course is designed as an orientation to relevant primary, secondary and tertiary resources used to provide drug information for clinical questions, and associated professional responsibilities. In addition, the course will include information on study designs, biostatistics, and introduction to clinical literature evaluation. The application of timely and rigorously analyzed healthcare literature is essential to formulating and implementing optimum drug therapy policy and decisions. This course will assist in developing skills needed to retrieve relevant literature, evaluate the merits of findings in the literature, and then applying those found to be scientifically sound to the clinical management of patients.

IV.   Curricular Objectives and Outcomes

CAPE

Domain 1 – Foundational Knowledge

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*.

Domain 2 – Essentials for Practice and Care

2.1. Patient-centered care (Caregiver) - Provide *patient-centered care* as the medication expert (collect and interpret evidence, prioritize, formulate assessments and recommendations, implement, monitor and adjust plans, and document activities).

2.2. Medication use systems management (Manager) - Manage patient healthcare needs using human, financial, technological, and physical resources to optimize the safety and efficacy of medication use systems.

2.3. Health and wellness (Promoter) - Design prevention, intervention, and educational strategies for individuals and communities to manage chronic disease and improve health and wellness.

2.4. Population-based care (Provider) - Describe how *population-based care* influences *patient-centered care* and influences the development of practice guidelines and evidence-based best practices.

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.

3.6. Communication (Communicator) – Effectively communicate verbally and nonverbally when interacting with an individual, group, or organization.

Domain 4 – Personal and Professional Development

4.1. Self-awareness (Self-aware) – Examine and reflect on personal knowledge, skills, abilities, beliefs, biases, motivation, and emotions that could enhance or limit personal and professional growth.

4.2. Leadership (Leader) - Demonstrate responsibility for creating and achieving shared goals, regardless of position.

4.3. Innovation and Entrepreneurship (Innovator) - Engage in innovative activities by using creative thinking to envision better ways of accomplishing professional goals.

4.4. Professionalism (Professional) - Exhibit behaviors and values that are consistent with the trust given to the profession by patients, other healthcare providers, and society.

ACPE Appendix 1 Required Elements:

Clinical Sciences 1CS03: Health information retrieval and evaluation - Critical analysis and application of relevant health sciences literature and other information resources to answer specific patient-care and/or drug-related questions and provide evidence-based therapeutic recommendations to healthcare providers or, when appropriate, the public.

Biomedical Sciences 1BS02: Biostatistics - Appropriate use of commonly employed statistical tests, management of data sets, and the evaluation of the validity of conclusions generated based on the application of those tests to the data sets.

V. **Course Specific Objectives and Outcomes**
   At the conclusion of this course, students should be able to:
   - Define drug information
   - Identify drug information services provided by pharmacists
   - Describe skills needed to perform drug information responsibilities
   - Describe practice opportunities in drug information for pharmacists
   - Describe the rationale and approach of using evidence-based medicine compared to other sources of knowledge.
   - Effectively answer drug information questions, which includes:
     o determining actual information requested
     o developing an effective clinical question

- o obtaining background information
- o formulating an appropriate response using relevant resources
- Demonstrate the effective use of tertiary drug information resources and evaluate the strengths and weaknesses of tertiary sources.
- Evaluate the accuracy, comprehensiveness, and mode of maintenance of online health information.
- Perform effective Internet searching for secondary sources via the use of Boolean operators and filtering.
- Describe the importance of the citation process and apply it to citing sources in AMA format.
- Locate primary literature and utilize it to answer drug information questions
- Analyze relevant scientific literature and drug trials with respect to research methods and designs.
- Given a data set, identify which of the 4 types of data is being used.
- Provide an example of the data type in a real-world scenario.
- Given a data set, calculate the appropriate measure of central tendency for the data type and any other appropriate descriptive statistics.
- Describe the scientific method.
- Define: epistemology.
- (a)Identify the difference between experimental study designs and observational study designs, and (b) discuss when each study design is most appropriate:
    - o Randomized Controlled Trials (experimental)
    - o Nonrandomized Controlled Trials (quasi-experimental)
    - o Cohort Studies (observational)
    - o Case-Control Studies (observational)
    - o Case Reports (anecdotal)
- Given a study design, rank it on the level of evidence ladder.
- Discuss the measurability and importance of different study outcomes.
- Calculate:
    - o Risk Ratio (Relative Risk)
    - o Odds Ratio
    - o Absolute Risk Reduction
    - o Relative Risk Reduction
- Given a study's results, explain what each of the above mean for that study in lay terms.
- Use p-value and/or confidence interval to determine if a study's results are "statistically significant."
- Discuss the interplay between a study's results, Type 1 and Type 2 error, and our interpretation of those results.
- Given a pharmacoeconomic study, identify its analysis type(s):
    - o cost-minimization
    - o cost-benefit
    - o cost-effectiveness
    - o cost-utility
- Define:
    - o Discounting
    - o Decision Tree
    - o Markov Model
- Describe the process of developing a journal club presentation
- Discuss the benefits of journal club participation
- Apply the concepts of literature evaluation to a journal club presentation
- Explain the purpose and role of peer review
- Describe the reasons to participate in peer review
- List reasons to decline a peer review invitation
- Discuss the most important aspects of a manuscript to assess during peer review
- Describe the process for involving a learner in a peer review assignment
- Discuss the effects of pharmacoeconomic studies on health care decision-making.

- Describe the legal issues related to the provision of drug information (DI).
- Apply various legal theories that impose liability on pharmacists providing DI.
- Describe how pharmacists can help protect themselves from malpractice claims resulting from the provision of DI.
- Explain the Doctrine of Drug Overpromotion as it pertains to the 1997 Food and Drug Administration Modernization Act (FDAMA).
- Identify the liability concerns inherent with off-label drug use and informed consent.
- Describe U.S. copyright law as it pertains to the provision of DI.
- Identify copyright, liability, and privacy issues arising from the Internet and Social Media.
- Describe the legal and ethical challenges emerging in telemedicine and cybermedicine.
- Describe the DI plan that addresses the Health Insurance Portability and Accountability Act (HIPAA) of 1996.
- Explain the legal issues involved with industry support for pharmaceutical educational activities.
- Explain characteristics that differentiate an ethical deliberation from other types of decision-making.
- Interpret and make use of ethics rules, principles, and theories to analyze identified ethical dilemmas.
- Identify and analyze examples of ethical dilemmas that may arise for health professionals when providing drug information, in various practice settings and for various types of clients and circumstances.
- Identify micro, meso, and macro levels of ethical decision-making that may occur during the provision of pharmacy practice.
- Use the described process of ethical analysis in order to propose and justify a specific decision or course of action in an ethical dilemma case.
- Describe resources and structures that can prepare, guide, and support clinicians faced with ethical dilemmas during the course of providing drug information.

VI. Course Topics

History of drug information centers, role of the drug information specialist, poison control centers, evidence-based medicine, drug information question formulation and response process (PICOT method), tertiary resources (including evidence-based drug information databases and other internet resources), clinical guidelines, secondary databases (PubMed-Medline, OVID, and EBSCO Discovery), search strategies for secondary databases (Boolean operators and filtering), AMA citation style, study design (descriptive, observational, and experimental), levels of evidence, types of variables, types of data, descriptive vs. inferential statistics, measures of central tendency, measures of variability, data distributions, confidence intervals, data presentation, hypothesis testing, power, Type I and Type II Errors, one- and two-tailed hypotheses, p-values, clinical vs. statistical significance, parametric vs. non-parametric statistics, and the Chi-square test, z-test, t-tests (one-sample, two-sample, and paired), ANOVA, F-test, and post-hoc comparisons, cost-minimization, cost-benefit, cost-effectiveness, cost-utility, discounting, decision tree, Markov Model, legal and ethical considerations of DI, basics of developing a journal club, benefits of journal club, purpose of peer review, reasons to participate in review process

VII. Instructional Methods and Activities

Instructional methods may include: traditional lectures, distance learning, in-class discussion of journal articles, small group discussion, problem-based learning, group projects/presentations, individual projects/presentations, lectures/presentations via Moodle, independent study and assignments/exercises completed in or out of the classroom. Active participation is required during classroom and group activities, and will be moderated by the instructor. Students are expected to be competent in the use of Microsoft Word (or another word processing program), Microsoft Excel, Microsoft PowerPoint, and the ULM Moodle and email systems. Lack of these competencies may place the student at a disadvantage and could adversely impact the scores on required course activities.

VIII.   Evaluation and Grade Assignment
The first portion of this course will be evaluated with a pre and post learning assessment. The purpose of this assessment is to evaluate student learning by providing a baseline for what students already know and to track student growth. This assessment will be administered twice: once during the first week of class and again after the fifth week of class. The assessment is a 15 question, multiple choice quiz that covers tertiary, secondary, and primary sources. The pre-learning assessment, taken in week 1, will be graded for completion rather than accuracy. The post learning assessment, taken after week 5, will be graded for accuracy.

Other assignments/quizzes will be assigned per instructor as outlined in the syllabus or at the discretion of the instructor. Quizzes/assignments may be given in any format be they instructor including via ExamSoft.

Grades will be calculated as follows:
Quizzes/assignments will comprise of 70% of the final grade. The group journal club and corresponding evaluations will comprise 30% of the final grade.

Professionalism/Participation:
Professionalism is a key component as a pharmacist. The instructors in the course value professionalism and will be assessing your professionalism throughout the course. Remember to treat your professors and fellow students as you would want to be treated.   Grades on the above graded objects may be impacted by non-professional behavior.

- *Several (but not all) active-learning exercises will be assigned a grade. Your best, original effort is expected for all exercises, assignments and activities.*
- *Late assignment submissions will not be accepted unless you contact the course coordinator PRIOR to the time due.*
- *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.*

Grading Scale:
89.5 – 100%   A
79.5 – 89.49% B
69.5 – 79.49% C
59.5 – 69.49% D
≤59.49%   F
Student Success Policy: http://www.ulm.edu/pharmacy/currents.html
Remediation Policy: http://www.ulm.edu/pharmacy/currents.html

IX.   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:
a.   Textbooks, Materials and Hardware:
  1. Malone PM, Mosdell KW, Kier KL and Stanovich JE. *Drug Information: A Guide for Pharmacists.* 7th Edition Stamford, CT: McGraw-Hill, 2014 (Available online at AccessPharmacy – see COP Library Resources Toolbox, or https://accesspharmacy.mhmedical.com/book.aspx?bookID=3132

  2. Additional REQUIRED reading materials may be posted on Moodle by course faculty.

  3. Required Technology: Laptops will be used extensively during this course, **particularly for quizzes, in-class exercises and exams**. Students' laptops **must** meet the minimum technology requirement

policy posted on the pharmacy web page here, https://www.ulm.edu/pharmacy/intops/technology.html in order to participate at the highest level of performance in this course. The technical support area of the College of Pharmacy will be available for connectivity issues relating to our wireless network. However, they will NOT be providing in-depth technical support for the computers.

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.

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 providing documentation to the faculty, which will be verified. 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:** The class does not utilize exams, however multiple in class activities may be evaluated as graded materials. If you are absent for one of these you will receive a zero on the assignment. If you have an excused absence, you will receive a no-grade for that assignment which will not impact your final grade in the course.

Refer to the Excused Absence Process Policy on the Current Students webpage: http://www.ulm.edu/pharmacy/currents.html

d. **Academic Integrity:** Faculty and students must observe the ULM published policy on Academic Dishonesty (see Page 4 of the ULM *Student Policy Manual* - http://www.ulm.edu/studentpolicy/). All professional students will adhere to the standards set forth in the School of Pharmacy's Code of Conduct (http://www.ulm.edu/pharmacy/currents.html).
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.

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.

Censures (Penalties)
Academic dishonesty will result in a referral to the Committee on Ethical and Professional Standards with a recommendation for a grade of "F" for the course and expulsion from the School of Pharmacy. 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, etc.), collaboration on take home exams, or the use of unapproved information or electronic devices to assist in obtaining an answer to the question.

e. **Course Evaluation Policy:** At a minimum, students are expected to complete the online course evaluation.

f. **Student Services:** Information concerning student services in the College 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 .

Mental Wellness on the ULM Campus
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.
- COP 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

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.

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 unlawful sexual harassment or gender-based discrimination, please contact Student Services at 318-342-5230 or to file a complaint, visit www.ulm.edu/titleix.

g. **Emergency Procedures**: Please review the emergency escape plan in the classrooms and hallways of the Bienville building. Move quickly and 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 the Bienville building 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. <u>The course coordinators reserve the right to adjust the syllabus or schedule, in accordance with University and School policies and procedures</u>**.

h. 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/bwgkogad.P_SelectAtypUpdate. Students should do this by the end of the first week of classes.

i.   This course is a major requirement for the Doctor of Pharmacy degree. 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.

X. Course Schedule - Subject to change at the discretion of the Course Coordinator.
Unless otherwise noted, *Class will meet in Bienville 340 -Tuesday and Thursday 10:00 - 11:15am*
Format Terminology:

Date	Week	Chapter(s)	Topics	Lecturer
8/22 & 8/24	1	1	Intro/syllabus/toolbox review	Manor
8/29	2	2	Evidence based medicine/creating a research question Pre-learning assessment Due 8/29	Deuber
8/31	2	3	Tertiary – Facts/Lexi-Comp	Deuber
9/5	3		Tertiary – Micromedex/Clinical Pharm.	Deuber
9/7	3		Internet Health Information/Guidelines	Deuber
9/12	4		Secondary – PubMed/Finding Full Text Articles Tertiary Sources Assignment due 9/12	Deuber
9/14			Secondary – AMA Citing/Plagiarism	Deuber
9/19	5	4-5	Study Design – Primary Literature Secondary Sources Assignment due 9/19	Deuber
9/21	5		Study Design – Literature Evaluation	Deuber
9/26 & 9/28	6	6	Application of Statistical Analysis Post Learning Assessment Due 9/26 (Deuber)	Donald

			In-class (post-class) assignments	
10/3 & 10/5	7	7	Pharmacoeconomics In-class (post-class) assignments	Donald
10/10 & 10/12			NO CLASS FALL BREAK	
10/17 & 10/19	8	9	Journal Club Quiz	Manor
10/24 & 10/26	9	10	Peer Review Quiz	Manor
10/31 & 11/2	10	11-12	Legal/ethical aspects of DI Quiz	Evans
11/7 & 11/9	11		Journal club group project NO CLASS	
11/14 & 11/16	12		Journal club presentations	Manor/Evans/Donald
11/21	13		Journal club presentations	Manor/Evans/Donald
11/28	14		Journal club presentations (if necessary)	Manor/Evans/Donald