Pharmaceutical Calculations – PHRD 4004

I. Contact Information
   Dr. Roxie Stewart, Pharm.D. (Course Coordinator)
   Clinical Associate Professor
   Office: Bienville 174F
   Phone: 318-342-1703
   Email (preferred): rstewart@ulm.edu
   Office hours: (Tuesday and Thursday 1pm-5pm, with the exception of lab weeks). These office hours are firm and must be kept.
   Math Lab: (Wednesday 11am-noon: Room 231) on dates outlined in the course schedule.

II. Course Prerequisite
   First year professional program standing. Credit or registration in PHRD 4020

III. Course Description
   Fundamentals of pharmaceutical measurement and calculations (2 cr hr)
   Course meets 8:00-8:50am Tuesday and Thursday in Bienville 340

IV. Curricular Objectives
   Foundational Knowledge (CAPE Domain 1)
      Develop, integrate, and apply knowledge from the foundational sciences to evaluate the scientific literature, explain drug action, solve therapeutic problems, and advance population health and patient-centered care (1.1 Learner)

      Essentials for Practice and Care (CAPE Domain 2)
      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. (2.1 Patient-centered care -Caregiver)

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

      Personal and Professional Development (CAPE Domain 4)
      Examine and reflect on personal knowledge, skills, abilities, beliefs, biases, motivation, and emotions that could enhance or limit personal and professional growth (4.1 Self-awareness)

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

V. Course Specific Objectives – At the conclusion of this course, students should be able to:
(CAPE 1.1.1) – Develop and demonstrate depth and breadth of knowledge in pharmaceutical, social/behavioral/administrative, and clinical sciences, as they apply to pharmaceutical calculations.

(CAPE 1.1.4) – Apply knowledge in foundational sciences to solve therapeutic problems and advance patient-centered care when performing pharmaceutical calculations.
(CAPE 2.1.2) – Interpret evidence and patient data in order to correctly calculate patient dosing.

(CAPE 2.2.2) – Describe the role of the pharmacist in impacting the safety and efficacy of each component of a typical medication use system (i.e. procurement, storage, prescribing, transcription, dispensing, administration, monitoring, and documentation) as it applies to pharmaceutical calculations.

(CAPE 2.2.6) – Apply standards, guidelines, best practices, and established processes related to safe and effective medication use when performing pharmaceutical calculations.

(CAPE 4.1.6) – Strive for accuracy and precision by displaying a willingness to recognize, correct, and learn from errors.

(CAPE 4.4.2) – Display preparation, initiative, and accountability consistent with a commitment to excellence.

VI. Course Topics
Fundamentals of pharmaceutical calculations; International system of units; Pharmaceutical measurement; Interpretation of prescriptions and medication orders; Density and specific gravity; Percent strength, ratio strength, and other expressions of concentration; Calculation of doses – general considerations and patient parameters; Calculations involving units of activity and other measures of potency; Electrolyte solutions – milliequivalents, millimoles, and milliosmoles; Intravenous infusions – parenteral admixtures, rate-of-flow calculations; Reducing and enlarging formulas; Use of a package insert; Selected calculations for NAPLEX review.

VII. Instructional Methods and Activities
Instructional methods may include but are not limited to traditional lectures, homework assignments, self-directed learning, case-based learning, student-led reviews, group work, quizzes, and use of technology. Math Lab will be offered on most Wednesdays during the semester. This is open to all students who wish to attend. During Math Lab any homework problem requested will be worked for the group, and any questions students may have will be answered. Math Lab will be held in room 231.

VIII. Evaluation and Grade Assignment
- There will be 3 examinations and a final examination. Due to the nature of this course, all examinations will be comprehensive. The number of lectures and questions will determine point distribution of each examination.
- Exam dates are scheduled in the course syllabus and will only be changed in the event of a University closure.
- All regular exams will be from 7:30-8:50am, given on regularly scheduled class days as outlined in the course schedule, unless otherwise determined by the course coordinator.
- Exams may be fill in the blank, multiple choice, short answer, matching, or any other format deemed necessary by the course coordinator.
- After exams have been graded and an item analysis performed, questions may be discarded or otherwise adjusted at the discretion of the Course Coordinator. Afterward, grades will be released to students.
- Quizzes/assignments will be given as deemed necessary. Quizzes may be announced or unannounced, and will be given via Moodle. Students must have laptops and calculators at all class meetings. Homework assignments may be collected at any time, checked for completion, assigned points, and returned. Assignments and quizzes will comprise 10% of the course grade.
Exam Behavior
- Privacy screens must be used at all times.
- ExamSoft will be used to administer exams; therefore, all students are required to have access to the most current version of the software.
- Exams must be downloaded from ExamSoft PRIOR to the date of the scheduled exam. Students will NOT be given extra time to allow for downloading at the time of the exam.
- Only a writing instrument and a non-programmable calculator should be at your desk during exams.
- Scratch paper will be given to you for use during the exam. 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.
- The use of a programmable calculator or any electronic device capable of storing, receiving or transmitting data, is 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 front of the room.
- Students are not allowed to leave the classroom during an examination.
- Students wishing to review their exams with the course coordinator or designee must do so within 2 weeks of when the regular exam scores are posted, and within 1 week of the time the final exam score is posted.

**Assessment Method**

<table>
<thead>
<tr>
<th>Assessment Method</th>
<th>Percent of Final Grade</th>
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<tbody>
<tr>
<td>Examinations</td>
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<tr>
<td>Exam #1</td>
<td>20%</td>
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<tr>
<td>Exam #2</td>
<td>20%</td>
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<tr>
<td>Exam #3</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>30%</td>
</tr>
<tr>
<td>Assignments/quizzes</td>
<td>10%</td>
</tr>
<tr>
<td>Total percent</td>
<td>100%</td>
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**Bonus Points** – A maximum of 5 bonus points earned on the Boot Camp calculations exam will be added to the final exam score. They will NOT be added to the final average.

**Grading Scale**

- 89.5-100% A
- 79.5 - 89.4% B
- 69.5 - 79.4% C
- 59.5 - 69.4% D
- <59.5% F

Undergraduate mid-term grades will be posted online for students to view via Banner. Mid-term grades indicate a student’s status at mid-semester only and do not indicated the final outcome of a student.

**Student Success – Early Intervention Policy** – (Modified for this course)
Students scoring <70% on any exam and/or an overall average <70% will be required to participate in early intervention. Early intervention includes the following:
• Student must review each failed exam's Exam-Soft generated missed item report with the course coordinator within one week of the failed exam.
• Class attendance will be mandatory until the student is no longer part of Early Intervention.
• Homework assignments will be mandatory until the student is no longer part of Early Intervention. Students must have all homework reviewed for completeness by the course coordinator or her designee before the next class period.
• Mandatory attendance will be required at every Math Lab offering on Wednesday from 11am-noon (Room 231) until the student is no longer a part of Early Intervention.
• Student must meet with the Director of Professional Affairs.

These requirements must be followed until the student has a class average >70%. Failure to meet these requirements will result in the student’s ineligibility to remediate.

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. Textbook(s) and Materials:
Required Textbook

Textbook is available at the ULM Library. It is also available online through the School of Pharmacy (SoP) Library Resources TOOLBOX (on Moodle) under the LWW Health Library. Remember that this resource is only available to you while you are in the professional program. Therefore, it is HIGHLY recommended that you purchase a book for your personal library.

Other Required Materials:
Laptop computers must be available at all times.
Basic Calculator for homework and classwork (excluding exams) must be available at all times.
Pencil/Pen
Homework must be done on loose leaf paper and kept in a binder (since it may be taken up for points). When homework is collected, take pages out of binder, fold in half lengthwise, and write your name on the outside.

B. Attendance Policy:
The ULM School of Pharmacy follows the University Attendance Policy. http://catalog.ulm.edu/content.php?catoid=23&navoid=2875&hl=attendance&returnto=search#Class_Attendance_Regulations_Excused_Absences

C. Excused Absence/Make-up Policy:
A student missing a graded exercise (exam, quiz, or assignment) must contact the course coordinator via email or phone prior to the graded exercise if possible. In case of an emergency, a student should contact OSPA. OSPA will then notify faculty. The student must contact the course coordinator within 48 hours of the emergency. Upon return to classes, the student should bring a valid written excuse to the OSPA. OSPA will verify the validity of the excuse on the same day it is dropped off. Students should then present the validated excuse to the course coordinator. The course coordinator is the only person who can grant an “excused absence.” Failure of the student to contact the course coordinator within 48
hours of the emergency will result in a zero (0) grade for that exercise. 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. Failure to attend a scheduled make-up exam will result in a zero (0) grade for that exam. Students missing an exam due to a University approved excuse will take the make-up exam as determined by the course coordinator.

D. Academic Integrity:
Faculty and students must observe the ULM published policy on Academic Dishonesty (see 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.

Students are expected to work independently on examinations, quizzes, and assignments unless otherwise stated by the instructor.

*It is the student’s responsibility to be familiar with and abide by all policies regarding academic dishonesty.*

Academic dishonesty will result in a referral to Committee on Ethical and Professional Standards with a recommendation for a grade of “F” for the course and expulsion from the School. 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 possession of unapproved information or electronic devices. Possession of prior course materials is prohibited in this course.

E. Course Evaluation Policy:
At minimum, students are expected to complete the on-line course evaluation to provide anonymous, constructive, specific comments regarding the course at the end of the semester. Additional assessment opportunities may also be offered. The Course Coordinator is always open to feedback throughout the semester.

F. Student Services:
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 School’s technical standards and policies concerning students with special needs [http://www.ulm.edu/studentpolicy/studentpolicy.pdf]. ULM student services, such as Student Success Center [http://ulm.edu/cass/], Counseling Center [http://ulm.edu/counselingcenter/], and Student Health Services, is available at the following Student Service web site http://ulm.edu/studentaffairs/.

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

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 in 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 orderly to the appropriate stairwell and exit the building. The meeting place for this class will be the far end of the North parking lot. 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 911 from a campus phone and **342-5350** from cell phones.

*The course coordinator reserves the right to adjust the syllabus or schedule, in accordance with University and School policies and procedures.*

H.  **Discipline/Course Specific Policies**

- Students are to exhibit professional behavior at all times.
- Students are expected to be prepared for class and to arrive on time. Tardiness and disruptiveness will not be tolerated. If you cannot make it to class before class begins, do not enter the classroom! This is not only disruptive to your professor but also to your peers. You will be considered absent for the day.
- Students using programmable calculators, cell phones, or any other non-approved device will receive a zero on that exam/quiz and will be reported to the Dean of Academic Affairs. Borrowing a calculator from someone else or using someone else's calculator during an examination or quiz will not be permitted.
- Students are expected to follow all policies. Failure to adhere to University, College of Pharmacy, and class policies will result in disciplinary action accordingly.
# Tentative Course Schedule

Course Coordinator: Dr. Roxie Stewart, Pharm.D; Bienville 174F; 342-1703; rstewart@ulm.edu

Office hours: posted

*The instructor reserves the right to adjust the schedule as needed*

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<tr>
<th>DATE</th>
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<tbody>
<tr>
<td>Aug 21</td>
<td>Syllabus; Review of Boot Camp Lecture Material</td>
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<tr>
<td>Aug 23</td>
<td>Interpretation of Prescriptions and Medication Orders</td>
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<td>Aug 28</td>
<td>Density and Specific Gravity</td>
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<td>Aug 30</td>
<td>Percent Concentration and Ratio Strength</td>
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<tr>
<td>Sept 4</td>
<td>Percent Concentration and Ratio Strength and Review for Exam #1</td>
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<tr>
<td>Sept 6</td>
<td>Aliquot Method of Weighing and Measuring (not on Exam #1)</td>
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<td>Sept 11</td>
<td>Exam #1</td>
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<tr>
<td>Sept 13</td>
<td>Aliquot Method of Weighing and Measuring (Lab Prep)</td>
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<td>Sept 18</td>
<td>Calculation of Doses</td>
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<td>Sept 20</td>
<td>Patient Parameters</td>
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<td>Sept 25</td>
<td>Units, Measures of Potency; Review for Exam #2</td>
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<tr>
<td>Sept 27</td>
<td>Selected Clinical Calculations –(Heparin; Equianalgesic Dosing) – (not on exam #2)</td>
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<td>Oct 2</td>
<td>Exam #2</td>
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<tr>
<td>Oct 4</td>
<td>Selected Clinical Calculations (Creatinine Clearance, IBW, Monitoring)</td>
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<td>Oct 9</td>
<td>Intravenous Infusions, Parenteral Admixtures</td>
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<td>Oct 11</td>
<td>Rate of Flow Calculations</td>
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<td>Oct 16</td>
<td>Powder Volume/Package Inserts</td>
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<tr>
<td>Oct 18</td>
<td>Pulling it all Together – Selected Exercises</td>
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<tr>
<td>Oct 23</td>
<td>Review for Exam #3</td>
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**Fall Break begins Thursday October 25th**

| Oct 30 | Altering Product Strength, Stock Solutions (Not on Exam #3) |
| Nov 1 | Exam #3 |
| Nov 6 | Alligation |
| Nov 8 | Reducing and Enlarging Formulas |
| Nov 13 | Selected Calculations in Contemporary Compounding |
| Nov 15 | Selected Calculations in Contemporary Compounding |
| Nov 20 | Selected Calculations in Contemporary Compounding |

**Thanksgiving Holidays begin at noon Wed Nov 21st**

| Nov 27 | Selected Calculations for NAPLEX prep and Review Ch 11, 12 |
| Nov 29 | Review for Final Exam - optional |
| Dec 3 | FINAL EXAMINATION 9AM-11AM |