West Los Angeles College

Department of Allied Health

Pharmacy Technician Program

I.	<u>COURSE TITLE:</u>	Pharmacy Calculations Class ID (1627)
II.	<u>PREPARED BY:</u>	Pharmacy Technician Adjunct Faculty
III.	<u>REVISED FOR:</u>	Fall 2015
IV.	<u>PREREQUISITES:</u>	*Enrolled Pharmacy Technician Students Only*
V.	<u>DAYS AND HOURS:</u>	Wednesday and Friday 1:00pm-3:05pm
VI.	<u>COURSE INSTRUCTOR:</u>	Pamela Moore- BS, CPhT, RPhT
VII.	<u>OFFICE PHONE NUMBER:</u>	(310) 287-4464
		Email: Moorepl@wlac.edu
VIII.	<u>OFFICE HOURS:</u>	15 minutes before class or by appointment
IX.	<u>COURSE DESCRIPTION</u>	

In this course students will learn calculations related to drug dosage, measurements of strength and preparation of medications. This course also includes inter-conversion of units in the metric and common systems of measurement. Emphasis is placed on unit-cancellation for solving pharmacy problems. This course includes a verbal component.

X.   <u>REQUIRED TEXTBOOKS & MATERIALS</u>

<u>Textbook:</u>

- Mosby's Pharmacy Technician: Principles and Practice-4th Edition

    Joshua Neumiller, et al

    ISBN: 978-1-4557-5178-5

<u>Materials Required:</u>

- Basic Pocket Calculator
- Highlighter Pens or Markers

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Student Learning Outcomes (SLOs) Addressed in this course

Critical Thinking: Analyze problems by differentiating fact from opinions, using evidence and sound reasoning to specify multiple solutions and their consequences. Learn the types of calculations commonly encountered in community (retail) and institutional (hospital) pharmacies. Students will master calculative skills by building upon theories and formulas in a logical fashion.

Quantitative Reasoning: Identify, analyze, and solve problems that are quantitative in nature.

Course Objectives:

Upon successful completion of this course, the student will be able to:

Mathematics Review	Calculate with common and decimal fractions.
	Convert Roman numerals to their number equivalent.
	Practice equations using common mathematical symbols.
Metric System	Describe the pattern of metric units.
Metric Systems (Continued)	Define metric abbreviations.
	Convert between metric units using unit-cancellation.
	Identify metric units of strength or product labels.

Course Objectives continue on next page.

Common Systems	Describe the values and define the abbreviations and symbols used in the apothecary and avoirdupois systems. Convert between common system units using unit-cancellation. Identify apothecary and avoirdupois units of strength on product labels.
System Conversion	Describe the relationship between metric and common system units. Convert between the metric and common systems.
Calculation of Dosage	Define the prescription abbreviations that affect drug dosage. Calculate drug dosage based on body weight. Calculate the amount drug needed per does per day. Apply the concepts of volume maximums for parenteral routes. Calculate the duration for therapy for a given drug order. Practice unit-cancellation word problems, including those involving "units" of activity, milli-equivalents, and milli-moles. Solve dosage problems using product labels to obtain information. Solve dosage problems presented in prescriptions and chart orders, as well as in verbal "pharmacy situations."
Percentage Preparations	Calculate the amount of active ingredient in given quantities of solutions and mixtures using unit-cancellation. Calculate the percentage and ration strengths of specific solutions and mixtures. Perform the calculations necessary to prepare solutions and mixtures of given concentrations, including Add Quantity Sufficient to Make (QSAD) formulas. Solve percentage problems using product labels, prescriptions, chart orders, and verbal pharmacy situations.
Dilutes and Concentration	Calculate the strength of diluted solutions using unit-cancellation. Determine the amount of drug needed to prepare a specific stock solution. Calculate the amount of stock solution needed to prepare a desired dilution. Explain the cautions to remember in the use of the allegation.
(AHSP Module 19) Preparation of Noncompounded Products Part 1	OBJ 3.5. Accurately count or measure finished dosage forms as specified by the prescription medication order. IO 3.5.1 Accurately use the metric system to count and measure. IO 3.5.2 Accurately use the avoirdupois system to count and measure IO 3.5.3 Accurately use the household system (e.g. teaspoon, tablespoon) to count and measure. IO 3.5.4 Accurately use the apothecary system to count and measure. IO 3.5.5 Demonstrate skill in the operation of common pharmaceutical measurement and weighing devices. IO 3.5.6 Accurately convert among the measurement systems, depending up on the desired end point.
(ASHP Module 20) Preparation of Nonsterile Compounded Products (Part 1)	OBJ 3.7 Accurately determine the correct amounts of ingredients for a compounded product. IO 3.7.1 Given mathematical problems using Roman numerals, Arabic numerals, fractions, apothecary symbols, and decimals, perform the mathematical steps to solve for the correct answer. IO 3.7.2 Given mathematical problems involving conversion of weights and measures and direct ration and proportion, perform the mathematical steps for the correct answer. IO 3.7.3 Given mathematical problems involving reducing and enlarging formulas, perform the mathematical steps to solve for the correct answer. IO 3.7.4 Given mathematical problems involving specific gravity, percent strength, weight-in-volume, weight-in-weight, and volume-in-volume, perform the mathematical steps to solve for the correct answer. IO 3.7.5 Given mathematical problems involving pharmaceutical preparations, perform the mathematical steps to solve for the correct answer.

	IO 3.7.6 Given mathematical problems involving dilution and concentration, perform the mathematical steps to solve for the correct answer. IO 3.7.7 Given mathematical problems involving dilution and concentration, perform the mathematical steps to solve for the correct answer using the allegation method. IO 3.7.8 Given mathematical problems involving millequivalents, perform the mathematical steps to solve for the correct answer. IO 3.7.9 Given mathematical problems involving compounded products that require and overfill, perform the mathematical steps to solve for the correct volume to be added.

XIII. METHODS OF INSTRUCTION:

Lectures, discussions, activities, and student participation will be used as the methods of instruction in this course.

XIV. METHODS OF EVALUATION:

6 Quizzes   40%

Homework Assignments   10%

Final Exam   50%

Course Grades will be assigned based on the following scale:

90-100% = A

80-89% = B

70-79% = C

60-69% = D

59% and below = F

Lower than 60% is a non-passing grade and constitute failure in this course. A grade of "C" or higher is required for credit in the "credit/no credit" grading option.

XV. STUDENT RESPONSIBILITIES, POLICIES, AND ADVICE:

- Students are required to abide with the Student Code of Conduct and all College policies at all times. These policies may be found in the schedule of classes, course catalog, or online. **Remember:** Any disruptive behavior may result in exclusion from the class.

- Electronic devices (Cell phones, recording devices, iPods and Android tablets, etc.) **MAY** be used to assist students in the learning process **ONLY AT THE INSTRUCTOR'S DISCRETION**, the above devices can be used based on a semester by semester basis due to students' level of

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respect and maturity. **ALL CELL PHONES ARE TO BE PLACED ON THE "VIBRATE" MODE WHILE IN CLASS...NO EXCEPTIONS!!!** If you are expecting an emergency call, please inform the instructor before class, and leave the classroom quietly when you receive the call.

- **It is in your best interest to attend every class.** Unexcused absences will be handled in accordance with WLAC's Attendance policy*. If it is necessary to miss a class for any reason, please inform the instructor ahead of time. Proper documentation will be required in order to have an excused absence.
- Exam material will come from anything and everything we cover in this course. Weekly exams and the Final exam are the property of the instructor. Copying questions from any exam **is an act of cheating...Plagiarism is an act of cheating!** Please use references for any ideas, words, sentences, phrases, and paragraphs that you borrow from another source.
- **You are to be in class on time and prepared!** All readings and homework assignments must be completed ahead of time. **ALL WORK WILL BE COLLECTED AT THE BEGINNING OF CLASS** unless otherwise stated by instructor.
- Students requiring modification/special accommodations should see the instructor to make appropriate arrangements as soon as possible. Students newly arriving to West Los Angeles College that are Foster Youth in need of resources should also meet with the instructor as soon as possible.
- Please note that make-ups will be administered at the discretion of the instructor, only when suitable documentation is available. If you know you will be absent, please inform the instructor ahead of time.

*Please be aware that attendance will affect your grade by 5% is deducted from your total grade for each unexcused absence. Three (3) unexcused tardies constitute one absence.

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<u>Course Content Outline</u>

LECTURE/CLASSROOM SCHEDULE-Fall 2015

Note: The schedule is tentative, therefore, subject to change depending upon the class progress. You are responsible for all the announcement and materials covered during your absence.

Wk 1 Wed 09/02 Fri 09/04	Roman Numerals Fractions	**Classwork:** Ch. 6 **Homework:** Ch. 6 (TBA)
Wk 2 Wed 09/09- Fri 09/11	Fractions Decimals	**Classwork:** Ch. 6 **Homework:** Ch. 6 (TBA)
Wk 2 Wed 09/09- Fri 09/11	Quiz 1 Measurements	**Classwork:** Ch. 6 **Homework:** Ch. 6 (TBA)
Wk 3 Wed 09/16- Fri 09/18	Measurements	**Classwork:** Ch. 6 **Homework:** Ch. 6 (TBA)
Wk 3 Wed 09/16- Fri 09/18	Quiz 2 Equations and Variables	**Classwork:** Ch. 6 **Homework:** Ch. 6 (TBA)
Wk 4 Wed 09/23- Fri 09/25	Ratios and Proportions	**Classwork:** Ch. 6 **Homework:** Ch. 6 (TBA)
Wk 4 Wed 09/23- Fri 09/25	Quiz 3 Formula Methods	**Classwork:** Ch. 6 **Homework:** Ch. 6 (TBA)
Wk 5 Wed 09/30- Fri 10/02	Percents and Solutions	**Classwork:** Ch. 6 **Homework:** Ch. (TBA)
Wk 5 Wed 09/30- Fri 10/02	Quiz 4 Alligation Method	**Classwork:** Ch. 6 **Homework:** Ch. 6 (TBA)
Wk 6 Wed 10/07- Fri 10/09	Power Volume	**Classwork:** Ch. 6 **Homework:** Ch. 6 (TBA)
Wk 6 Wed 10/07- Fri 10/09	Quiz 5 Dip Rate/Flow Rate	**Classwork:** Ch. 6 **Homework:** Ch. 6 (TBA)
Wk 7 10/14-10/16	Pediatric Dosing Business Calculations	**Classwork:** Ch. 6 **Homework:** Ch. 6 (TBA)

Wk 7 Wed 10/14- Fri 10/16	Quiz 6 Business Calculations Discuss Final Exam	Classwork: Ch. 6 Homework: Ch. 6 (TBA)
Wk 8 10/21-23	Review for Final Exam **Final Exam: Concepts covered in Ch. 6 of Textbook**	