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### PHA 101T.01: Pharmacy Calculations

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THE UNIVERSITY OF MONTANA  
MISSOULA  
COLLEGE OF TECHNOLOGY  
HEALTH PROFESSIONS DEPARTMENT

COURSE SYLLABUS

**Course number and title:** PHA 101T "Pharmacy Calculations"

**Date revised:** 8/27/04

**Semester credits:** 3

**Meeting schedule:** MWF, 8:10-9:00 in AD04

**Contact hours per semester:** [For administrative purposes only]

Lecture hours per week: 3

Lab hours per week: 0

Clinical/internship hours per week: 0

**Instructor:** Lisa Wrobel, PharmD., R.Ph.

**E-mail:** lisa.wrobel@umontana.edu

**Phone:** (406) 243-7813

**Office:** AD04B, (Administration building)

**Office hours:** M,W, F 10:30-11:30 or by appointment

**Required text:** Dosage Calculations (Pickar, 7th edition)

**Supplies:** A simple, non-programmable calculator.

**Prerequisites:** Enrollment in the Pharmacy Technology Program. Knowledge of basic algebra is strongly recommended prior to enrolling in the program. ASSET score above 41 in "numerical skills", or COMPASS scores above 44 "pre-algebra" are preferable. Those with lower scores may need tutoring or developmental math courses before enrolling in the program. See advisor for individual recommendations.

**Relationship to program(s):**

It is imperative that pharmacy technicians have solid math skills in order to perform the functions necessary for safe dosage preparation and dispensing. This course prepares students to perform the functions in dispensing and sterile products labs in PHA 103 during the semester to follow.

**Course description:**

Calculations used in pharmacy practice; includes various systems of weights and measures, dosage determinations, percentage preparations, reducing and enlarging formulas, dilution and concentration.

**Student performance outcomes:**

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

1. Use Roman numerals as they apply to pharmaceutical quantities.
2. Solve basic algebraic equations for "X", using the ratio-proportion method.
3. Find the percentage of a quantity.

4. Understand the various systems of measurement used in pharmacy: the metric system, apothecary system, household system, and other common drug measurements such as units and milliequivalents.
5. Perform conversions between the various systems of measurement when applicable.
6. Convert between traditional and military time, and between Celsius and Fahrenheit temperatures.
7. Use the various equipment available for measuring medications.
8. Interpret drug orders and understand drug labels.
9. Calculate oral and parenteral dosages of drugs using both the ratio-proportion method and the  $\frac{D}{H} \times Q = X$  method.
10. Understand how to calculate pediatric dosages and chemotherapeutic dosages based on patient weight and/or body surface area.
11. Calculate dosages from various concentrations of injectable drugs, including the preparation of IV "piggybacks" and large volume parenterals.
12. Perform advanced intravenous calculations including IV flow rates and drop factor calculations. Be able to schedule preparation of IV fluids based on infusion time.

**How various assessment methods will be used to improve the course:**

- Class discussions and review sessions will help to identify problem areas in student comprehension of materials. Relating material to clinical experiences will be an important part of these discussions.
- Post-test review in class will help to ensure understanding of material.
- Test question failure rate will be analyzed to improve test content.
- Individual advising sessions with students will help identify program strengths and weaknesses in achieving each student's goals.
- Student evaluations at the end of the course will help to identify problem areas, which will be revised accordingly.

**Student performance assessment and grading procedures:**

The grading system is department-wide and is as follows:

90-100%	A
80-99%	B
70-79%	C
60-69%	D
below 60%	F

Students in the Pharmacy Technology program must have a "B" or better final grade in all pharmacy classes in order to progress within their programs. A "C" or better is needed in all non-pharmacy courses. If these goals are not met, students will have to retake the class if they wish to continue in the program. Students **may not** take a class with a "PHA" prefix more than twice.

**Course grades will be based on the following:**

20% of the grade will be quizzes (you will be allowed to drop your two lowest scores)  
25% of the grade from the first mid-term  
25% of the grade from the 2<sup>nd</sup> mid-term  
30% of the grade from the final

- There will be a **quiz every Friday** (except on test days) starting September 10<sup>th</sup>.
- There will be **three mid-term exams**, the dates of which are yet to be determined, but they will all be on Fridays.
- The **final exam** will be held on **Friday December 17<sup>th</sup> from 8:00 – 10:00 a.m.** and will be comprehensive.

***Palm-pilots, multi-functional calculators, and cell-phones will not be allowed on desktops during quizzes or exams.***

**Tests must not be missed.** If you have a legitimate reason for missing the test, let me know ASAP. If I feel your excuse is legitimate, a test will be issued to you at the ASC center to be taken. The ASC center has limited hours about which the student is expected to be informed.

**Course outline:**

Each chapter of the text will be covered *in sequence*. Students will be assessed by a quiz every Friday. The chapters are as follows:

1. Math Review for Dosage Calculations - Arabic and Roman numerals, fractions and decimals
2. Math Review for Dosage Calculations – ratios, percents, simple equations, and ratio-proportions
3. Systems of measurement
4. Conversions: Metric, Apothecary, and Household Systems
5. Conversions for Other Clinical Applications: Time and Temperature
6. Equipment Used in Dosage Measurement
7. Interpreting Drug Orders
8. Understanding Drug Labels
9. Oral Dosages of Drugs
10. Parenteral Dosages of Drugs
11. Using Ratio-Proportion to Calculate Dosages
12. Pediatric Dosages\*
13. Reconstitution of Noninjectable Solutions\*
14. Intravenous Solutions, Equipment, and Calculations\*
15. Advanced Pediatric Calculations\*
16. Advanced Adult Intravenous Calculations\*

**Students must have access to an internet-capable computer and have the ability to open e-mail and attachments in Microsoft Word. It is the students' responsibility to have this access in place prior to beginning the course.**

**Academic dishonesty:** Students found guilty of cheating *or helping others to cheat* will be given an F as their final grade in the course without exception. No second chances will be allowed due to the significance of such dishonest behavior in a health oriented profession, and the possible dire consequences such dishonest behavior could on the public, the profession of pharmacy, and our school, if allowed to continue.

**Students with disabilities:** eligible students with disabilities will receive appropriate accommodations in this course provided it is requested in a timely manner. If you are a student with disabilities, please speak with me and be prepared to provide a letter from your DSS coordinator.