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: 8/22/06
Semester credits: 3
Contact hours per semester: [For administrative purposes only]
  Lecture hours per week: 3
  Lab hours per week: 0
  Clinical/internship hours per week: 0
Meeting schedule: TR, 10:40-12:00 in HB17

Instructor: Mary McHugh, R.Ph.
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Phone: (406) 243-7813
Office: AD04B, (Administration building)
Office hours:

Required text: Pharmacy Calculations for Technicians (3rd edition) by Ballington/Green.
Supplies: A simple, non-programmable calculator.

Prerequisites: Enrollment in the Pharmacy Technician Program and successful completion of
  the following courses: WTS100S or 115S, CRT100, MAT100, SCN119N, MED154T.

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 will prepare the student
with the necessary math skills to perform the functions required in dispensing of medications
and preparing sterile products in the PHA 103 lab during the semester to follow.

Course description:
Calculations used in pharmacy practice; includes various systems of weights and measures
(metric, apothecary, household), conversions between these systems, ratio/proportions, dosage
determinations, percentage preparations, reducing and enlarging formulas, dilution,
concentration, allegation, flow rates, international time, temperature measurements, and
compounding formulas, and business math.

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 the ratio-proportion method, the \( \frac{D}{Q} = \frac{X}{H} \) method, and dimensional analysis.
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.
13. Use math skills for basic business calculations.
14. Be able to accurately dilute solutions to desired concentrations and volumes.
15. Understand how to use alligation when mixing two solutions of differing concentrations.

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 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 the program. A “C” or better is needed in all non-pharmacy courses.

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 2nd mid-term
- 30% of the grade from the final
General Schedule:

- There will be a **quiz every Tuesday** (except during test weeks) starting September 5th.
- There will be two mid-term exams, with the following **tentative** dates:
  - Exam #1 Thursday, September 28th
  - Exam #2 Thursday, November 9th
- The **final exam** will be comprehensive and will be held during the week of December 11th – **exact date TBA**.

Course outline:

Each chapter of the text will be covered *in sequence* except for chapter 3 (which is not covered). Students will be assessed by a quiz every Tuesday (except during “test weeks”). The chapters are as follows:

1. Understanding Subdivisions of Numbers, Number Systems, Estimating, and Accuracy.
3. **(Not covered.)**
4. Applying Metric Measurements and Calculating Dosages
5. Using Household Measure in Pharmacy Calculations **and Appendix C**
6. Preparing Injectable Medications
7. Preparing Intravenous Medications
8. Using Special Calculations in Compounding
9. Using Business Math in the Pharmacy
10. Understanding the Apothecary System

**Palm-pilots, multi-functional calculators, and cell-phones will not be allowed on desk-tops 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, you may take a make-up exam at the ASC center. The student is responsible for calling the ASC center to reserve a make-up test time. At least 48-hours advance notice is required.

**Internet Access:** Students must have access to the internet (computer access available on campus). Many notes and assignments must be accessed through Blackboard On-Line Learning. E-mails regarding information about this course will be sent to the students University of Montana e-mail address. Please be familiar with this e-mail system and check it regularly.

**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.