Course Information

Division: Allied Health  
Course Number: HCE 115  
Title: Pharmacy Calculations  
Credits: 2  
Developed by: Dr. Siripoon  
Lecture/Lab Ratio: 2 Lecture/0 Lab  
Transfer Status:  
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<th>ASU</th>
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Activity Course: No  
CIP Code: 51.0800  
Assessment Mode: Pre/Post Test (50 Questions/50 Points)  
Semester Taught: Fall  
GE Category: None  
Separate Lab: No  
Awareness Course: No  
Intensive Writing Course: No

Prerequisites
HCE 114 or MAT 077 or higher with a grade of "C" or higher or placement test score as established by District policy

Educational Value
This course is intended for students and community members who are interested in any Allied health major.

Description
This course includes mathematical concepts for pharmaceutical calculations. Emphasis is on using ratios, percents, and proportions in dosage equations, applying metric measurements in ratios and proportions, preparing pharmaceutical solutions, using business math in the pharmacy, and understanding the apothecary system.

Supplies
Calculator
Competencies and Performance Standards

1. Review basic math.
   **Learning objectives**
   What you will learn as you master the competency:
   a. Change Roman numerals to Arabic numbers.
   b. Change Arabic numbers to Roman numerals.
   c. Determine the value of a decimal.
   d. Round decimals appropriately.
   e. Add and subtract fractions.
   f. Reduce fractions to lowest terms.
   g. Change fractions to decimals.
   h. Change decimals to fractions.

   **Performance Standards**
   Competence will be demonstrated:
   o on assigned activities
   o on written exams

   Performance will be satisfactory when:
   o learner responds correctly to exam questions

2. Use ratios, percents, and proportions in dosage equations.
   **Learning objectives**
   What you will learn as you master the competency:
   a. Define ratio and percent.
   b. Apply ratio and proportion in problem calculations.
   c. Convert percents to fractions, decimals, and ratios.
   d. Convert fractions to percents.

   **Performance Standards**
   Competence will be demonstrated:
   o on assigned activities
   o on written exams

   Criteria - Performance will be satisfactory when:
   o learner responds correctly to exam questions

3. Apply metric measurements in ratios and proportions.
   **Learning objectives**
   What you will learn as you master the competency:
   a. Identify the basic units of the metric system.
   b. Convert metric units from larger units to smaller ones and smaller units to larger ones.
   c. Use metric measurement in pharmaceutical calculations.
   d. Set up ratio and proportion problems using metric measure.
   e. Use ratio and proportion to solve calculation problems.
f. Calculate dose based on weight.
g. Calculate dose based on body surface area (BSA).

**Performance Standards**

*Competence will be demonstrated:*
- on assigned activities
- on written exams

*Criteria - Performance will be satisfactory when:*
- learner responds correctly to exam questions

4. **Convert household and metric pharmacy measurements.**

**Learning objectives**

*What you will learn as you master the competency:*
- a. Identify units of household measure.
- b. Convert between units of household measure.
- c. Solve medication problems using household measure.
- d. Identify approximate household measurements.
- e. Convert between household measure and the metric system.
- f. Convert within systems.
- g. Calculate pediatric doses using a formula.

**Performance Standards**

*Competence will be demonstrated:*
- on assigned activities
- on written exams

*Criteria - Performance will be satisfactory when:*
- learner responds correctly to exam questions

5. **Prepare pharmaceutical solutions.**

**Learning objectives**

*What you will learn as you master the competency:*
- a. Describe percentage as weight in weight, weight in volume, and volume in volume.
- b. Use powder volume in solving solution problems.
- d. Solve solution preparation problems using the allegation method.

**Performance Standards**

*Competence will be demonstrated:*
- on assigned activities
- on written exams

*Criteria - Performance will be satisfactory when:*
- learner responds correctly to exam questions
6. Measure fluids and convert temperatures.

Learning objectives
What you will learn as you master the competency:

a. Identify millimoles, milliequivalents, and specific gravity.
b. Calculate problems using millimoles, milliequivalents, and specific gravity.
c. Describe units.
d. Calculate temperature conversion from Celsius to Fahrenheit and from Fahrenheit to Celsius.

Performance Standards
Competence will be demonstrated:

- on assigned activities
- on written exams

Criteria - Performance will be satisfactory when:

- learner responds correctly to exam questions

7. Prepare drugs for intravenous administration.

Learning objectives
What you will learn as you master the competency:

a. Identify the major types of IV sets by drops delivered.
b. Calculate IV flow rates using various sets.
c. Demonstrate rounding-off time for IV due times.
d. Calculate rate of IV infusion.

Performance Standards
Competence will be demonstrated:

- on assigned activities
- on written exams

Criteria - Performance will be satisfactory when:

- learner responds correctly to exam questions

8. Use business math in the pharmacy.

Learning objectives
What you will learn as you master the competency:

a. Identify and calculate overhead cost.
b. Identify gross and net profit.
c. Calculate markup and markup rate.
d. Compute discounts.
e. Apply average wholesale price to profit calculations.
f. Calculate inventory turnover.
g. Calculate depreciation.

Performance Standards
Competence will be demonstrated:

- on assigned activities
9. Understand the apothecary system.

Learning objectives
What you will learn as you master the competency:

a. Identify symbols and measures of the apothecary system.
b. Use the apothecary system to solve medication problems.
c. Identify approximate equivalent apothecary and metric units.
d. Convert measurements between the apothecary and metric systems.

Performance Standards
Competence will be demonstrated:

Criteria - Performance will be satisfactory when:

Types of Instruction
Classroom Presentation

Grading Information
Grading Rationale
A pretest will be administered at the beginning of the course, which will not count as part of the final grade. The final written exam (posttest) will count as 25% of the final grade. The three written exams will count as 75% of the final course grade.

Grading Scale
A  90-100%
B  80-89%
C  70-79%
D  60-69%
F  0-59%