PHARMACOLOGICAL CALCULATIONS
Course Syllabus

Course Number: THRP-0123      OHLAP Credit: No
OCAS Code: None
Course Length: 60 Hours
Career Cluster: Health Science
Career Pathway: Therapeutic Services
Career Major(s): Pharmacy Technician, Advanced Pharmacy Technician

Pre-requisite(s):
Basics of pharmaceutical mathematics are covered to include reading, interpreting and solving calculation problems encountered in the preparation and distribution of drugs. Conversions of measurements, ratio and proportion, percentage, dilution and concentration, mill equivalents, units, intravenous flow rates, and solving dosage problems are included.

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Textbooks:
- Pharmacy Calculations for Technicians 5th Edition, text with Study Partner CD
- Certification Exam Review 3rd Edition, text with Study Partner CD
- Pharmacy Practice for Technicians 5th Edition, text with Study Partner CD
- Pharmacy Labs for Technicians, Second Edition , text with NRx Simulation CD
- Blackboard

Course Objectives:

A. Practice Fundamentals of Mathematical Calculations
1. Express Arabic numbers as Roman numerals.
2. Express Roman numerals as Arabic numbers.
3. Identify the numerator and denominator in a fraction.
4. Add and subtract fractions.
5. Multiply and divide fractions.
6. Add and subtract decimals.
7. Multiply and divide decimals.
8. Convert fractions to decimals.
9. Convert decimals to fractions.
10. Define percent.
11. Convert percents to fractions.
12. Convert percents to decimals.
13. Convert fractions to percents.
15. Define ratio.
16. Convert ratios to fractions.
17. Convert ratios to decimals.
18. Convert ratios to percents.
19. Convert fractions to ratios.
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20. Convert decimals to ratios.  

B. Use Units and Measures for the Calculation of Drug Dosages  
1. Explain the apothecary system.  
   a. Units of fluid measure  
   b. Units of weight measure  
   c. Perform fundamental computations and conversions within the system  
2. Explain the Avoirdupois (household) measurement system.  
   a. Units of fluid measure  
   b. Units of weight measure  
   c. Perform fundamental computations and conversions within the system.  
3. Explain the metric system.  
   a. Units of length measure  
   b. Units of weight measure  
   c. Units of volume measure  
   d. Express metric measure correctly using the naming convention of the metric system  
   e. Perform fundamental computations and conversions within the system.  
4. Convert between the systems.  
   a. Conversion of linear measurements  
   b. Conversion of volume measurements  
   c. Conversion of weight measurements  

C. Use Ratio and Proportion  
1. Define ratio and proportion.  
2. Define means and extremes.  
3. State a ratio-proportion to solve a given dose calculation problem.  
4. Calculate problems for a missing term using ratio and proportion method.  

D. Perform Pharmaceutical Calculations  
1. Calculate doses for oral and liquid medications using ratio and proportion method.  
   a. Calculations involving tablets  
   b. Calculations involving capsules  
   c. Calculations involving liquids  
2. Calculate quantities to be administered when medication is ordered in fractional doses.  
   a. Dosages based upon weight.  
   b. Dosages based upon age.  
   c. Dosages based upon formulas.  
   d. Dosages based upon nomograms.  
4. Calculate dosages for individual patients given the patient’s weight and/or height and the recommended dose.  
5. Perform calculations necessary for the infusion of I.V. medications.  
   a. Calculate I.V. flow rates  
   b. Calculate I.V. infusion and completion times  
6. Calculate doses of parenteral medications already in solution.  
7. Calculate doses from reconstituted medications.  
8. Determine the best concentration strength for medications ordered when there are several directions for mixing.  
9. Determine amount of insulin to be administered based upon labels.  
   a. Low-dose
b. Regular ¹

c. U-100 ¹

10. Calculate dilutions and concentrations for solutions. ¹
a. Dilution and concentration of liquid solutions ¹
b. Dilution of stock solutions ¹
c. Dilution and concentration of solid solutions ¹
d. Alligation calculations ¹

¹ ODCTE Objective
All unmarked objectives are TTC instructor developed.

Teaching Methods: The class will primarily be taught by the lecture and demonstration method and supported by various media materials to address various learning styles. There will be question and answer sessions over material covered in lecture and media presentations. Supervised lab time is provided for students to complete required projects.

Grading Procedures: 1. Students are graded on theory and lab practice and performance.
2. Each course must be passed with seventy (70%) percent or better.
3. Grading scale: A=90-100%, B=80-89%, C=70-79%, D=60-69%, F=50-59%.
4. Career Major grades established during coursework are a major criteria in successfully obtaining certification.

Description of Classroom, Laboratories, and Equipment: Tulsa Technology Center campuses are owned and operated by Tulsa Technology Center School District No. 18. All programs provide students the opportunity to work with professionally certified instructors in modern, well-equipped facilities.

Available Certifications/College Credit: The student may be eligible to take state, national or industry exam after completion of the program. College credit may be issued from Oklahoma State University-Okmulgee or Tulsa Community College. See program counselor for additional information.

College Credit Eligibility: The student must maintain a grade point average of 2.0 or better.