

College of San Mateo
Official Course Outline

1. **COURSE ID:** NURS 610 **TITLE:** Basic Medication Dosage Calculations for Nurses
Units: 1.0 units **Hours/Semester:** 16.0-18.0 Lecture hours; 32.0-36.0 Homework hours; 48.0-54.0 Total Student Learning hours
Method of Grading: Pass/No Pass Only
Prerequisite: Successful completion of Intermediate Algebra or equivalent, or placement by other measures as applicable.
2. **COURSE DESIGNATION:**
Degree Credit
Transfer credit: CSU
3. **COURSE DESCRIPTIONS:**
Catalog Description:
Designed to meet the needs of current and potential practitioners of nursing. The safe and accurate administration of medications to a client is an important and primary responsibility of the nurse. A step-by-step approach to medication dosage calculations by various routes of administration will be used. This course will help nurses in applying basic mathematical concepts to real world clinical situations. Dosage accuracy is emphasized in clinical scenarios that apply critical thinking skills.
4. **STUDENT LEARNING OUTCOME(S) (SLO'S):**
Upon successful completion of this course, a student will meet the following outcomes:
 1. Understand the three ways to calculate medication doses.
 2. Apply medication calculation strategies when interpreting physician medication orders.
 3. Understand the different ways to calculate IV administration using micro and macro tubing and IV pump calculations
5. **SPECIFIC INSTRUCTIONAL OBJECTIVES:**
Upon successful completion of this course, a student will be able to:
 1. Evaluation of the physician's order.
 2. Review the more common medical acronyms
 3. Convert units of measure between metric, household, and apothecary methods.
 4. Solve basic medication dosage calculation problems using the ratio-proportion method from a physician's order. A. Use of ratio-proportion in drug calculation from a physician order. B. Important points when calculating dosages using ratio-proportion: a. Same unit and system of measure. b. Estimation of approximate and reasonable answer. c. Setting up proportion labeling all of terms in a proportion. d. Label the value you obtain for X.
 5. Solve basic medication dosage calculation problems using the dimensional analysis method from a physician's order. A. Identification of the formula and meaning of initials in formula. B. Steps for use of formula. C. Rules for conversion.
 6. Calculate dosages using different measurement systems from a physician's order. A. Four rules for calculating drug dosages: a. Use correct units of measure. b. Double-check decimals and zeros. c. Question the answer d. Get out the calculator B. Helpful hints to minimize dosage mistakes: a. Calculate approximate dosage. b. Write out all calculations using the paper formula. c. Recheck calculation with another RN. C. Special considerations for tablets, capsules & liquids (oral and parenteral). D. Two-step dosage calculations.
 7. Examine methods for calculating an intravenous (IV) flow rate A. Continuous IV versus intermittent IV Administration. B. IV sets: Macro vs. micro drops. C. Calculation of IV flow rate
6. **COURSE CONTENT:**
Lecture Content:
 1. Evaluation of the physician's order.
 2. Solve basic medication dosage calculation problems using the ratio-proportion method from a physician's order.
 - A. Use of ratio-proportion in drug calculation from a physician order.
 - B. Important points when calculating dosages using ratio-proportion:
 - a. Same unit and system of measure.

- b. Estimation of approximate and reasonable answer.
 - c. Setting up proportion labeling all of terms in a proportion.
 - d. Label the value you obtain for X.
3. Solve basic medication dosage calculation problems using the dimensional analysis method from a physician's order.
 - A. Identification of the formula and meaning of initials in formula.
 - B. Steps for use of formula.
 - C. Rules for conversion.
 4. Calculate dosages using different measurement systems from a physician's order.
 - A. Four rules for calculating drug dosages:
 - a. Use correct units of measure.
 - b. Double check decimals and zeros.
 - c. Question the answer
 - d. Get out the calculator
 - B. Helpful hints to minimize dosage mistakes:
 - a. Calculate approximate dosage.
 - b. Write out all calculations using the paper formula.
 - c. Recheck calculation with another RN.
 - C. Special considerations for tablets, capsules & liquids (oral and parenteral).
 - D. Two-step dosage calculations.
 5. Examine the three methods for calculating an intravenous (IV) flow rate and select one of the methods for IV calculation.
 - A. Continuous IV versus intermittent IV Administration.
 - B. IV sets: Macro vs. micro drops.
 - C. Calculation of IV flow rate:
 - a. Three-step method
 - b. Two-step method
 - c. One-step method
 6. Determine the IV flow rate, infusion time, amount of drug in a specific solution and 24 hour intake for macro and micro drop infusions.
 - A. Calculate IV flow rates when several solutions are ordered.
 - B. Determine the drug amount in a specific amount of solution.
 - C. Determine infusion times and volumes.
 - D. Recalculate IV flow rate.
 - E. Determine if the IV is on time, ahead or behind.

7. REPRESENTATIVE METHODS OF INSTRUCTION:

Typical methods of instruction may include:

- A. Lecture
- B. Activity
- C. Discussion
- D. Observation and Demonstration
- E. Other (Specify): Computerized quizzes. "Kahoot" download from app store. Online Jeopardy game. Student-student interaction, small group work.

8. REPRESENTATIVE ASSIGNMENTS

Representative assignments in this course may include, but are not limited to the following:

Writing Assignments:

Summarize notes for dosage calculations.

Reading Assignments:

Students are given an elementary math review quiz to submit prior to the start of the course. There are several in-class quizzes that are submitted by the students to evaluate their learning of the different math methods and types of calculations discussed during the class.

9. REPRESENTATIVE METHODS OF EVALUATION

Representative methods of evaluation may include:

- A. Class Participation
- B. Class Work
- C. Group Projects
- D. Homework

E. Quizzes

F. Students' in-class work and bookwork will be evaluated for completeness and level of competency. A written pretest will be given at the beginning of the course for assessing the level of competency prior to instruction. Multiple medication dosage calculation tests will be given with feedback. A written post-test will be given at the end of the course.

10. **REPRESENTATIVE TEXT(S):**

Possible textbooks include:

A. Curren, A.M, Munday, L.D.. *Dimensional Analysis for Meds*, Current ed. San Diego: Wallcur, Inc., 2020

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