

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: MATHEMATICS FOR ADMINISTRATION OF MEDICATIONS

Code No: NUR 109

Program: NURSING

Semester: ONE

Date: SEPTEMBER, 1989

Author: MARGARET HURTUBISE

New

Revision:

APPROVED:

Handwritten signature
 O' / *irpfi'rsoui* ^'iA./i / ^ ^^ '

Date

/ __, " __'

MATHEMATICS FOR ADMINISTRATION OF MEDICATIONS

NUR 109

Course Name

Course Number

COURSE DESCRIPTION;

This course is designed to assist beginning nursing students to learn the mathematical skills required for the administration of medications- Credit for Section A may be obtained by means of a challenge examination. Emphasis is placed on mastery of skills since this is essential for client safety in nursing practice.

HOURS/SEMESTER;

Section A - 15 hours (3 hours/week)

Section B - K)^ hours {1 hour/week)

TOTAL - 25 hours

CREDITS

one

PRE-REQUISITE:

This course is required for the Nursing Clinical course in Semester 2 (NUR 117).

EVALUATION;

- 1) Credit for Part A may be obtained by means of a challenge examination given at the beginning of the course. All students are required to take Part B.
- 2) A passing grade must be obtained in Part A and Part B. A passing grade is at least an "A" (80-89%); a mark below 80% is an "R" (repeat).
- 3) One supplemental exam will be offered in Part B of the course.
- 4) Attendance is mandatory.
- 5) Failure to achieve a passing grade in this course will affect the student's progress in the program.

COURSE OBJECTIVES:

PART A

A. Whole Numbers

- 1) read, write and recite numerals and word statements naming whole numbers one to a million
- 2) read whole numbers from graduated scales
- 3) identify place values of digits
- 4) arrange numbers in ascending and descending orders
- 5) convert Roman numerals - arabic numerals {1-50}
- 6) add, subtract, multiply and divide whole numbers up to 7 digits
- 7) given quantities and values, calculate solutions to problems, using addition, subtraction, multiplication and division
- 8) given a total quantity, calculate quantities over a given time

B. Fractions

- 1) define fractional terms
- 2) read, write and recite numerals naming decimal fractions
- 3) arrange fractions in ascending or descending order of value, given any three fractions
- 4) add, subtract, multiply and divide fractions and mixed numbers
- 5) given 2 fractions with unlike denominators, find their lowest common denominator
- 6) given improper fractions, change to mixed numbers of the simplest form or whole numbers
- 7) given common fractions, change to higher or lower equivalent fractions
- 8) solve simple problems using addition, subtraction, multiplication and division of fractions and mixed numbers

C. Decimals

- 1) define decimal
- 2) read, write and recite numerals naming decimal fractions up to three decimal places
- 3) compare decimals and arrange in ascending or descending order of value
- 4) round decimals to the nearest whole number, tenth, hundredth or thousandth
- 5) read decimals from a graduated scale from 0 to 1.0
- 6) add, subtract, multiply and divide decimals
- 7) change a common fraction or mixed number to a decimal and vice versa
- 8) multiply and divide whole numbers and decimals by 10, 100 and 1000
- 9) solve simple problems, using addition, subtraction, multiplication and division of decimals

D. Percent

- 1) explain the meaning of percent
- 2) read and write percent
- 3) change percent to a decimal and vice versa
- 4) change percent to a common fraction or a mixed number and vice versa
- 5) find a percent of a number and what percent one number is of another
- 6) solve simple problems involving percent

E, Units of Measure

- 1) identify the standard units of measure utilized in the metric and household systems for measuring length, volume and capacity, weight or mass, energy and temperature.
- 2) explain concept of abstract measure - eg: units
- 3) use these standard units to measure length, volume, weight and temperature
- 4) change a given number of linear units of *one* denomination to units of another denomination eg: mm, cm, m and km
- 5) change a given number of mass units of one denomination to units of another denomination eg: mg, g and kg
- 6) change a given number of volume and capacity units of *one* denomination to units of another denomination eg: cc, mL and L
- 7) solve problems involving weight and volumes eg: rag/mL

F- Ratio and Percent

- 1) define an equation and read and write numerals and word statements using equations
- 2) define terms - ratio, proportion and proportionals
- 3) read and write numerals and word statements involving ratio and proportion
- 4) given problems with 1, 2 or 3 knowns, solve for one unknown with particular emphasis on solutions and mixtures

G. Signed Numbers

- 1) define positive and negative
- 2) add/subtract signed numbers

PART B

- 1) use accepted abbreviations related to the administration of medications
- 2) use metric and household systems of measurement as they relate to the calculation of dosages of oral and parenteral medications and solutions
- 3) practise measurement using various pieces of equipment which are employed in the administration of medications and preparation of solutions
- 4) convert back and forth from metric to household systems of measurement
- 5) accurately solve calculation problems related to the preparation and administration of medications and solutions used in nursing practice
- 6) accurately calculate the rate of I.V. infusion in drops/minute or milliliters/hour given the drop factor and the amount of fluid to be infused over a given time

EVALUATION

1) Part B Tests

| | |
|---------------|---|
| Test #1 (30%) | Abbreviations/Metric System/Conversions Oral Medication Calculation |
| Test #2 (30%) | Metric Conversions/Oral and Parenteral Therapy Calculations |
| Test #3 (40%) | Calculation of Percentage Dosages & RatioSr I.V, Infusions and Objectives from Test #1 and #2 |

Test #1

Objectives to be covered on this test are:

- a) use accepted abbreviations related to administration of medications. Resource: Kozier & Erb, p. / Nishiura, p. 213, Squires, p. 536 and handout.
- b) know metric and household system of measurements as it relates to calculation of medications.

be able to convert from metric to household measurements and vice versa

Resources; Nishiura, "The Metric System", p- 97-99, and "The Household System", p. 101-103.
Handout of "Household to Metric Conversions"

- c) use metric and/or household system of measurement in order to calculate required dosages of oral medications

Resources: Nishiura, "Oral Medication", p. 125 - 136.

Test #2

Objective to be covered on this test is:

- a) use metric and/or household system of measurement in order to calculate required dosages of parenteral medications

Resource; Nishiura, "Parenteral Medications", p. 137-155

- b) be able to calculate dosages of oral or parenteral medications based on body weight

Resource: Nishiura, "Dosages Based on Body Weight", p. 156-159

Test #3

Objectives to be covered on this test are:

- a) be able to calculate solution problems in ratio and percentage strength only

Resource; Nishiura, "Ratios", p. 102 & 103, "Percentage", p. 181 - 183.

- b) be able to calculate rates of I.V. infusion

Resource; Nishiura, "Intravenous Infusion", p. 139-143

- c) be able to use accepted abbreviations related to administration of medications

Resource: See Objectives for Test #1

- d) be able to convert from metric to household measurements and vice versa

Resource: See Objectives for Test #1

- e) be able to calculate dosages of oral medication

Resource; See Objective for Test #1

- f) be able to calculate dosages of parenteral medications

Resource; See Objective for Test #2

TEXTBOOKS:

Nishiura, Eizo, Schaum's Outline Series, "Mathematics for Nurses", McGraw-Hill Book Company, Toronto, Ontario/ 1986.