LAGUARDIA COMMUNITY COLLEGE
CITY UNIVERSITY OF NEW YORK
MATHEMATICS, ENGINEERING, & COMPUTER SCIENCE DEPARTMENT

MAT 106 – MATHEMATICS OF MEDICAL DOSAGES

2 PERIODS, 2 CREDITS PRE-REQUISITE: MAT 096

CATALOG DESCRIPTION

This course is designed for future health care professionals in the fields of nursing and veterinary technology. The course introduces students to the essentials of the medication administration process. Students become familiar with both the metric and household systems of measurement. Calculation of oral and parenteral doses are taught along with syringe scale reading. Calculations based on the size of the client as measured by weight or body surface area are included. The exploration of solutions prepares the student to calculate both intravenous and enteral dosages rates and flow rates. The mathematics for intravenous push, and the construction of titration tables are demonstrated. Pediatric dosages are calculated along with Daily Fluid Maintenance. Safe practices are stressed throughout the course.

INSTRUCTIONAL OBJECTIVES

1) To reinforce students' knowledge of basic mathematics
2) To familiarize students with the common systems of measurement used in healthcare.
3) To expose students to the techniques used in medical dosage calculations
4) To provide students with the ability to judge the appropriateness of answers by using estimation, and by calculating the safe dose range..
5) To calculate dosages for oral, parenteral, and intravenous routes of administration.

PERFORMANCE OBJECTIVES

At the completion of this course the students should be able:

1) To solve practical problems involving metric and household units of measure.
2) To convert from one unit of measure to another between systems as well as within a given system of measurement.
3) To calculate dosages using tablets and solutions for oral medication and parenteral therapy.
4) To calculate pediatric dosages and work out practical problems involving pediatric medications.
5) To calculate the rate of flow, dosage rate, and running time for intravenous fluids.

COURSE MATERIALS

Textbook: **Medical Dosage Calculations – 11th Edition** by Olsen, Giangrasso and Shrimpton, Pearson Prentice Hall Publishing, 2016.

Videos: Lectures covering each chapter are available in the Mathematics Tutoring Lab

EVALUATION

In order to achieve a passing grade, a student must successfully complete class work, class tests, and final exam. For purposes of computing the final grade, the suggested weighting is:

FINAL EXAM: 30%
CLASSWORK, ASSIGNMENTS, AND Quizzes: 70%

Assignments: At the end of each chapter there are **Practice Sets.** In these Practice Sets the **Try These for Practice** questions, the **Exercises** and the **Cumulative Review Exercises** should be done by the students; the answers are found in Appendix A of the textbook. The **Additional Exercises** and **Case Studies** are optional.

ATTENDANCE

Students are expected to attend all class meetings. Students are responsible for all information, material, and assignments covered in class regardless of class attendance. Students should consult the college catalog to find out the terms and conditions under which a WU, INC, or F grade may given to a student.

Course Content Outline
Each Chapter is designed to be covered in one week

CHAPTER 1 **Review of Arithmetic for Medical Dosage Calculations**

Diagnostic Test of Arithmetic
Changing Decimal Numbers and Whole Numbers to Fractions
Use of the Calculator
Ratios
Changing Fractions to Decimal Numbers
Rounding Decimal Numbers
  Rounding Off
  Rounding Down
Adding Decimal Numbers
Subtracting Decimal Numbers
Multiplying Decimal Numbers
Dividing Decimal Numbers
Estimating Answers
Multiplying Fractions
Dividing Fractions
Complex Fractions
Addition and Subtraction of Fractions
  Same Denominators
  Different Denominators

Compound Rates
Titrated Medications

CHAPTER 12 Calculating Pediatric Dosages
Pediatric Drug Dosages
Administration of Oral Medications
Administration of Parenteral Medications
Calculating Drug Dosages Based on Body Size
Administration of Intravenous Medications
Using a Volume Control Chamber
Calculating Daily Fluid Maintenance

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