



MATH 91 - Applied Math for Health Professionals Course Outline

Approval Date: 03/12/2020

Effective Date: 08/14/2020

SECTION A

Unique ID Number CCC000615980

Discipline(s) Mathematics

Division Mathematics

Subject Area Mathematics

Subject Code MATH

Course Number 91

Course Title Applied Math for Health Professionals

TOP Code/SAM Code 1702.00 - Mathematics Skills / E - Non-Occupational

Rationale for adding this course to the curriculum This is to support Health Occ students to learn math topics to help them be successful in their Health classes.

Units 3

Cross List N/A

Typical Course Weeks 18

Total Instructional Hours

Contact Hours

Lecture 54.00

Lab 0.00

Activity 0.00

Work Experience 0.00

Outside of Class Hours 108.00

Total Contact Hours 54

Total Student Hours 162

Open Entry/Open Exit No

Maximum Enrollment 25

Grading Option Letter Grade or P/NP

Distance Education Mode of On-Campus

Instruction Hybrid

Online with Proctored Exams

SECTION B

General Education Information:

SECTION C

Course Description

Repeatability May be repeated 0 times

Catalog Description This class is for students in the health professions who need review of math concepts such as ratios, fractions and measurements of the metric system. The topics covered specifically apply to health occupations.

Schedule Description

SECTION D

Condition on Enrollment

1a. **Prerequisite(s):** *None*

1b. **Corequisite(s):** *None*

1c. **Recommended:** *None*

1d. **Limitation on Enrollment:** *None*

SECTION E

Course Outline Information

1. Student Learning Outcomes:

- A. Perform arithmetic operations on numbers by hand
- B. Calculate drug dosages with dimensional analysis
- C. Compute conversions between systems

2. Course Objectives: Upon completion of this course, the student will be able to:

- A. Perform arithmetic operations with fractions, decimals, percents, ratios and proportions
- B. Apply an understanding of the metric, household and apothecary measurements to calculate doses
- C. Apply dimensional analysis to calculate weights, lengths, intake and output
- D. Calculate oral, parenteral, and pediatric dosages by applying dimensional analysis
- E.

3. Course Content

- A. Mathematics Skills
 - a. Add, subtract, multiply, simplify and divide mixed numbers
 - b. Add, subtract, multiply, simplify and divide fractions
 - c. Convert between mixed numbers and fractions
 - d. Reduce complex fractions
 - e. Add, subtract, multiply, divide and round decimals
 - f. Read and write decimal numbers
 - g. Multiply and divide decimals by a factor of 10
 - h. Compare fractions and decimals
 - i. Convert between fractions, decimals and percents
 - j. Calculate percentages
- B. Units and Measurements
 - a. Use the metric measures of weight, volume and length
 - b. Compute equivalents between the metric and household systems of measure by using dimensional analysis
 - c. Convert equivalent apothecary & metric measures
 - d. Calculate intake & output, weight and lengths

- e. Convert between Fahrenheit and Celsius
- f. Convert between a 24 hour clock and AM/PM
- C. Calculation of Drug Dosages
 - a. Use the dimensional analysis method to solve problems of oral dosages involving tablets, capsules, liquid medications and those measured in milliequivalents
 - b. Use the dimensional analysis method to solve parenteral dosage problems
 - c. Convert all measures to one system of measurement
 - d. Solve problems involving drugs measure in unit dosages
 - e. Calculate drug dosage for the reconstitution of a powdered drug into a liquid form
- D. Pediatric and Dosages
 - a. Convert between pounds and kilograms
 - b. Convert between grams and kilograms
 - c. Calculate pediatric dosages either the single or individual dose
 - d. Calculate a safe and therapeutic 24 hour dose range
 - e. Calculate the single-dose range from a a 24-hour dosage range
 - f. Calculate the daily fluid requirements for infants and young children
 - g. Calculate the body surface area (BSA) for medication administration
 - h.

4. Methods of Instruction:

Activity: Group or individual worksheets

Discussion: Whole classroom discussion regarding strategies for solving problems

Individualized Instruction:

Lecture: Problem demonstration and/or multimedia presentations

Observation and Demonstration: Student presentations

Online Adaptation: Activity, Individualized Instruction

2. Methods of Evaluation: Describe the general types of evaluations for this course and provide at least two, specific examples.

Typical classroom assessment techniques

Exams/Tests -- Chapter tests covering course content and comprehensive exams

Quizzes -- Periodic quizzes on course material

Oral Presentation -- Students may be asked to solve problems on the board

Home Work -- Reading from textbook sections and completing problems at end.

Final Exam -- Exam composed of problems covering course topics

Mid Term -- Exam(s) covering course topics

Additional assessment information:

The Mathematics Department maintains a commitment to diverse teaching methods in courses emphasizing vital quantitative skills and qualitative reasoning ability (PEP Program Mission Statement, 2011). To that end, it is expected that sufficient formative assessments will be given to students that in frequency, length and rigor adequately assess both quantitative skills and qualitative reasoning.

Letter Grade or P/NP

3. Assignments: State the general types of assignments for this course under the following categories and provide at least two specific examples for each section.

A. Reading Assignments

Read sections from the textbook, for example:

1. Read the section in Chapter 2 about Multiplying and dividing decimals by 10 or a power of 10. Be ready to solve problems in class.

2. In chapter 11, read the section titled "Oral Dosages Involving Capsules and Tablets: Dimensional Analysis Method." Be ready to discuss the section in class and work on problems in class.

B. Writing Assignments

Writing Assignments from the textbook

Students will solve problems from the workbook for the class

1. Complete the Chapter 2 decimal pretest to prepare to start Chapter 2 decimals in class.

2. Complete 1-10 on the Chapter 12 Parenteral Dosages worksheet and bring to class for discussion.

C. Other Assignments

D.

4. Required Materials

A. EXAMPLES of typical college-level textbooks (for degree-applicable courses) or other print materials.

Book #1:

Author: Ogden, S.,J., Fluharty, L.
Title: Calculation of Drug Dosages
Publisher: Elsevier
Date of Publication: 2020
Edition: 11th

Book #2:

Author: Morris, D. G.
Title: Calculate with Confidence
Publisher: Elsevier
Date of Publication: 2018
Edition: 7th

Software #1:

Title: Elsevier Adaptive Quizzing for Calculation of Drug Dosages
Publisher: Elsevier
Edition: 11th

B. Other required materials/supplies.