Cedar Crest College
Mathematics for Health Care Professionals – MAT 107 (3 credits)
Fall, 2009

Instructor: R. Reynolds
Office hours: Monday, Wednesday: 7:00 – 7:45 am, 9-11 am, 2– 5:15 pm
Tuesday: 11 am – noon
Friday: 7:00 am – 7:45 am, 9 – 11am
(or by appointment)
Office: Curtis 215
Extension: X3376
E-mail: rereynol(on campus); rereynol@cedarcrest.edu (off campus)

COURSE DESCRIPTION:

This course is designed to enable students planning careers in health professions to become familiar, confident, and proficient with the arithmetic, mathematical reasoning, and related terminology frequently encountered in health-related fields.

COURSE OUTCOMES:

Upon successful completion of the course, the student will demonstrate the following:

- the ability to solve practical problems encountered in health-related professions using multiple problem solving strategies
- proficiency in using basic arithmetic operations on fractions, decimals, and percents
- competence in problem solving using ratio and proportion
- algebraic reasoning
- proficiency in rounding, estimation, and mental math skills
- an understanding of measurement systems commonly used in health care and the ability to convert from one system to another
- competence in calculating drug dosages
- the ability to solve problems involving solutions
- fluency in verbal and written communication of relevant mathematical reasoning

Note: This course requires **significant** memorization of terminology, abbreviations, and conversions. Do not wait until the night before a test or exam to memorize terms – this will just add to the stress of test-taking and will prove unsuccessful. The task will be much easier if memorization is done in small manageable sessions STARTING AFTER THE FIRST CLASS and continuing throughout the semester. Try to set aside a portion of homework time each day to review previously memorized terms and to learn new ones as they occur.

INSTRUCTION METHODS:

The primary method of instruction will be lectures and discussions supported heavily by homework assignments. One of the most effective ways to learn mathematics is through practice and individual exploration; thus, this course is **heavily** homework intensive. Daily homework will be assigned for which the answers appear in the back of the textbook; students are expected to complete this homework before the next class meeting and be able to participate in class discussions involving these assignments. Specific homework assignments will be collected and graded regularly. Active individual and small group class participation, sharing, and involvement will be expected, encouraged, and will be a component of a student's final grade. The instructor wants to hear students talk about math – to get practice in using the terminology and mathematics involved in healthcare. Do not be afraid to make mistakes as they are part of the learning process. The student should consult the instructor with any questions/difficulties encountered in her/his studies; a student may be referred to the Advising Center for additional assistance. *Students with documented disabilities who may need academic accommodations should discuss these*

needs with the instructor during the first two weeks of class. Students with disabilities who wish to request accommodations should contact the Advising Center.

ATTENDANCE:

Students are expected to attend the class every time it meets. They are expected to be on time, to pay attention, to consider what they hear, and to respond appropriately – to be **engaged** in learning. Each student has her/his own unique contribution to make to the course, and the course is diminished if any student is not fully participating. When present in class, students are expected to be fully engaged in the class; a student is expected to pay attention, listen carefully, think critically about the material being discussed, and participate. Please do not do homework, study for other classes, sleep, etc., while in our class; if the instructor notices such behavior, she will mark the offending student absent. Students are responsible for all material presented including lectures, announcements of tests and quizzes, and homework assignments. Excessive absence **guarantees** an adverse impact on a student's final grade. Students are responsible for making sure that all assigned homework is handed in on time even if they must miss class. Late homework will generally be accepted as long as the instructor has not gone over it in class; however, the maximum grade that late homework can earn is a C. **Makeup exams and quizzes will be administered only if the student notifies the instructor before the exam with a valid personal or medical excuse.**

CALCULATORS and OTHER SUPPLIES:

Technology is essential in today's world, but it cannot be used as a replacement for basic understanding and intuition. A scientific calculator is necessary for this course and should be brought to each class meeting. However, the use of a calculator may be explicitly limited from time to time both in class and on exams. Remember, the most valuable calculator is the human brain. Accordingly, relevant mental math techniques will be reviewed and stressed throughout the course. A protractor will also be needed.

EVALUATION:

Three in-class tests and a cumulative final exam will be given. Homework will be collected and graded regularly. Class participation and individual effort will also enter into the computation of the student's final grade. Each student is expected to do her/his own work; do not invite trouble by working directly with someone else or by using material not authorized by the instructor. Violations of the Honor Code will be handled by the instructor, reported to the Provost, and will result in a grade of zero on the assignment/exam. Students are expected to include a brief honor code statement with each assignment (i.e., "I have followed the Cedar Crest Honor Code while completing this assignment" along with her/his signature).

Grade will be based on a relative scale with the following tentative weights:

Tests:	45% (15% each)
Final exam:	20%
Homework:	25%
Instructor evaluation:	10% (includes attendance and participation)
	100%

REQUIRED TEXT (Bring to each class):

Morris, Deborah Gray, *Calculate with Confidence*, fourth edition, (Mosby).

TENTATIVE COURSE OUTLINE

8/24	Introduction; chapter 1 – Roman numerals
8/26	chapter 2 – fractions
8/28	fraction arithmetic
8/31	chapter 3 – decimals
9/2	decimal arithmetic/rounding
9/4	chapter 4 – ratio and proportion - solving for an unknown
9/9	chapter 5 - percentages
9/11	review
9/14	**Test #1 – chapters 1 – 5**
9/16	chapter 6 – metric system
9/18	conversions between metric units
9/21	chapter 7 – apothecary and household measurement systems
9/23	chapter 8 – conversion between measurement systems
9/25	conversions (continued)
9/28	chapter 9 – converting between Celsius and Fahrenheit temperatures
9/30	weight/length conversions
10/2	chapter 10 - patient rights
10/5	**Test #2 – chapters 6 – 10**
10/7	chapter 11 - components of and abbreviations used in medication orders
10/9	chapters 12 and 13 – medical administration records/24 hour clock/medication labels
10/14	chapter 14 – calculating dosages using ratio/proportion
10/16	chapter 15 – calculating dosages using formulas
10/19	chapter 16 – calculation of dosages of oral medications (tablets, capsules)
10/21	calculation of dosages of oral medications (liquid)
10/26	chapter 17 – parenteral medications
10/28	parenteral medications (continued)
10/30	review
11/2	**Test #3 – chapters 11 – 17**
11/4	chapter 18 – powdered medications
11/6	chapter 19 – insulin administration
11/9	chapter 20 – pediatric dosages
11/11	pediatric dosages (continued)
11/13	IV calculations
11/16	IV calculations (continued)
11/18	IV calculations (continued)
11/20	geometry – angle measurements used in medicine (protractor needed)
11/23	set theory
11/30	problem solving in medicine using set theory
12/2	arithmetic/geometric sequences
12/4	graphical representation of data
12/7	modeling with linear functions
12/8	exponential growth

(Note: The last seven classes will include material that is not in the textbook. Therefore, it is critical that the student is present for these classes so that s/he is sufficiently prepared to complete the assigned homework and do well on the final exam.)