

BOROUGH OF MANHATTAN COMMUNITY COLLEGE

City University of New York

Department of Mathematics

Mathematics for Health Sciences

MAT 104-

Credits: 3

Class hours: 3

Instructor:

Office:

Phone:

Email:

Office Hours:

Course Description

This course covers computations and measurements essential in the health science professional fields with an emphasis on nursing. Topics include units and systems of measurement, reconstitution of powdered medications, oral and parenteral dosage calculations, adult and pediatric dosage calculations based on body weight, intravenous calculations, and pediatric medication calculations.

Prerequisites/Co-requisites

MAT 12, MAT 14, MAT 41, MAT 51, MAT 56.5, MAT 150.5, or MAT 161.5, if necessary.

Course Student Learning Outcomes	Measurements
Upon completion of the course, students will be able to:	
1. Read and write drug orders in the metric system and be able to convert units of volume, length, and weight between metric units.	1. Quizzes, tests, homework and/or projects
2. Read, interpret, and document information on medical administration records.	2. Quizzes, tests, homework and/or projects
3. Read and interpret information on medication labels, and use this information to correctly describe reconstitution procedures and to calculate the volume needed to administer drug dosages.	3. Quizzes, tests, homework and/or projects
4. Choose an appropriate syringe and mark syringes to indicate how drugs, including insulin and multiple drugs administered in the same syringe, would be measured.	4. Quizzes, tests, homework and/or projects
5. Calculate dosages and dosage ranges for drugs based on weight and body surface area, and assess ordered dosages of these drugs for safety.	5. Quizzes, tests, homework and/or projects
6. Calculate flow rate, dosage rate and infusion time for IV administration, including heparin and titration, and label IV fluid bags with progress and completion times.	6. Quizzes, tests, homework and/or projects
7. Assess whether the outcome of a given calculation is reasonable through quick mental estimation, checking answers against recommended ranges, and solving a problem using multiple methods.	7. Quizzes, tests, homework and/or projects

Below are the college's general education learning outcomes; the outcomes that are checked in the left-hand column indicate goals that will be covered and assessed in this course.

	General Education Learning Outcomes	Measurements
<input type="checkbox"/>	Communication Skills- Students will be able to write, read, listen and speak critically and effectively.	
<input checked="" type="checkbox"/>	Quantitative Reasoning- Students will be able to use quantitative skills and the concepts and methods of mathematics to solve problems.	Quizzes, tests, homework and/or projects
<input type="checkbox"/>	Scientific Reasoning- Students will be able to apply the concepts and methods of the natural sciences.	
<input type="checkbox"/>	Social and Behavioral Sciences- Students will be able to apply the concepts and methods of the social sciences.	
<input type="checkbox"/>	Arts & Humanities- Students will be able to develop knowledge and understanding of the arts and literature through critiques of works of art, music, theatre or literature.	
<input checked="" type="checkbox"/>	Information & Technology Literacy- Students will be able to collect, evaluate and interpret information and effectively use information technologies.	Quizzes, tests, homework and/or projects

Required Text & Readings

Anna Curren and Margaret Witt. *Curren's Math for Meds: Dosages & Solutions*, Eleventh Edition. Cengage Learning, 2015.

Evaluation & Requirements of Students

At the beginning of the semester, the instructor will advise the students of the determination of the final grade. Students are required to attend all scheduled classes.

Outline of Topics

Section	Title	Chapters	Pages
One	Refresher Math Fractions, Decimals	1-3	2-34
Two	Introduction to Drug Measures Metric System, Percentage, Milliequivalent, Ratio, and Household Measures	4-5	36-52
Three	Reading Medication Labels and Syringe Calibrations Oral and Parenteral Medication Labels and Dosage Calculation, Safe Medication Administration, Hypodermic Syringe Measurement, Reconstitution, Insulin	6-11	54-162
Four	Dosage Calculations Ratio and Proportion, Dimensional Analysis, Formula Method	12-14	164-226
Five	Dosage Calculation from Body Weight and Body Surface Area Adult and Pediatric Dosages Based on Body Weight and Body Surface Area* (* Calculations based on Body Surface Area are optional)	15-16	228-252
Six	Intravenous Calculations IV Therapy, IV Flow Rate Calculation, Calculating IV Infusion and Completion Times, IV Medication and Titration Calculations, Heparin Infusion Calculations	17-21	254-330
Seven	Pediatric Medication Calculations Pediatric Oral and Parenteral Medications, Pediatric Intravenous Medications	22-23	332-350

College Attendance Policy

At BMCC, the maximum number of absences is limited to one more hour than the number of hours a class meets in one week. For example, if you are enrolled in a three-hour class, you would be allowed 4 hours of absence (not 4 days). In the case of excessive absences, the instructor has the option to lower the grade or assign a grade of F. Students who stop attending the course may receive a grade of WU.

Academic Accommodations or Adjustments

Students who require reasonable accommodations or academic adjustments for this course must contact the Office of Accessibility. BMCC is committed to providing equal access to all programs and curricula to all students.

BMCC Policy on Plagiarism and Academic Integrity Statement

Plagiarism is the presentation of someone else's ideas, words or artistic, scientific, or technical work as one's own creation. Using the idea or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations, require citations to the original source. Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism.

Students who are unsure how and when to provide documentation are advised to consult with their instructors. The library has guides designed to help students to appropriately identify a cited work. The full policy can be found on BMCC's web site, www.bmcc.cuny.edu. For further information on integrity and behavior, please consult the college bulletin (also available online).