

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 Information

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, oral and parenteral dosage calculations, reconstitution of powdered medications, adult and pediatric dosage calculations based on body weight, and intravenous and critical care dosage calculations.

Prerequisites/Co-requisites

MAT 012 or MAT 051 if necessary

Student Learning Outcomes

Upon completion of the course, students will be able to:

- Read and write drug orders in the metric, apothecary, and household systems and be able to convert units of mass, volume, temperature, length, and weight within and between these systems.
- Read, interpret, and document information on medical administration records.
- 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.
- Choose an appropriate syringe and mark syringes to indicate how drugs, including insulin and multiple drugs administered in the same syringe, would be measured.
- Calculate dosages and dosage ranges for drugs based on weight and body surface area and assess ordered dosages of these drugs for safety.
- 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.
- 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.

Required Text & Readings

Morris, Deborah Gray. *Calculate with Confidence*, fourth edition. Elsevier Inc., 2006.

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 Roman Numerals, Fractions, Decimals, Ratio/Proportion, Percentages	1-5	7-56
Two	Systems of Measurement Reading and writing drug orders in the Metric, Apothecary, and Household Systems, Conversion within and between systems	6-9	63-103
Three	Medical Abbreviations, Orders, Charts, Labels The Six Rights of Medication Administration, Routes of Medication Administration, Equipment Used for Medication Administration, Reading and Writing Medication Orders, Reading, Interpreting, and Documenting Information on Medical Administration Records, Military Time	10-13	111-168
Four	Calculation of Simple Oral and Parenteral Medications	14-18	185-327
Five	Reconstitution of Solutions	19	351-366
Six	Insulin	20	389-402
Seven	Dosage Calculations Based on Weight and Body Surface Area*	21	415-444
Eight	IV Administration Calculation of Flow Rate and Infusion Time, Labeling IV bags	22	461-519
Nine	Critical Care Calculations Heparin calculations, Calculating Dosage Rate, Titration of Infusions	23-24	535-558

* Pages 436-444 are optional

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, you may be enrolled in a three-hour class. In that 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 an F or WU grade.

Academic Adjustments for Students with Disabilities

Students with disabilities who require reasonable accommodations or academic adjustments for this course must contact the Office of Services for Students with Disabilities. 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 side, www.bmcc.cuny.edu. For further information on integrity and behavior, please consult the college bulletin (also available online).