

MEDICAL MATH

CIP Code:51.9999

Units of Credit: 0.5

Pre-Requisite: Algebra II/ Secondary II PLUS a health science course

Levels: 11-12

Skill Certificate: Will be available

An instructional program that prepares students with skills to compute mathematical equations related to healthcare. The course integrates medical-physiological concepts and mathematics. Students will engage in math activities including problem solving, reasoning and proof, communication, connections, and representations.

Standard 1: Uses of Mathematics in Healthcare

1.1 Analyze the use of medical mathematics in the healthcare system

Standard 2: Common Mathematical Operations as used in Real World Health Care

- 2.1 Compute fluently and make reasonable estimates.
- Evaluate and simplify numerical expressions containing real numbers using the order of operations.
 - Compute solutions to problems and determine the reasonableness of an answer by relating them to the problem.
- 2.2 Represent real numbers in a variety of ways.
- Choose appropriate and convenient forms of real numbers for solving problems and representing answers, e.g., decimal, fraction, or percent.
- 2.3 Identify relationships among real numbers and operations involving these numbers.

- 2.1 Whole Numbers
- Supplies and inventories
 - Intake and output
 - Cholesterol
 - Quantities
 - Nutrition
 - Vital signs
 - Labs
 - Lever systems
- 2.2 Decimals
- Tools, instruments
 - Nutrition
 - Weights
 - Estimation
 - Temperature
 - EKG's
 - Medications
 - Labs

	<p>2.3 Fractions</p> <ul style="list-style-type: none"> · Tools, instruments · Weights · Estimation · EKG's · Medications · Labs · Conversions (F, C) <p>2.4 Percents</p> <ul style="list-style-type: none"> · Solutions · Labs · Growth Charts · Medications · Target heart rate · Stroke volume · Cardiac output · Blood loss · Body surface area, burns · Oxygen
Standard 3: Ratios and Proportions	
<p>3.1 Evaluate, solve, and analyze mathematical situations, using algebraic properties and symbols.</p> <p style="padding-left: 20px;">a. Solve proportions that include algebraic first-degree expressions.</p> <p>3.2 Use ratios to compare data.</p>	<p>3.1 Nutrition</p> <p>3.2 Labs</p> <p>3.3 Medications</p> <p>3.4 Diseases</p>
Standard 4: Gathering Data (Use of Medical Instruments)	
<p>4.1 Use patterns, relations, and functions to represent mathematical situations.</p> <p>4.2 Represent quantitative relationships using mathematical models and symbols.</p> <p style="padding-left: 20px;">a. Find and interpret rates of change by analyzing graphical and numerical data.</p> <p>4.3 Solve problems using visualization, spatial reasoning,</p>	<p>4.1 Conversions</p> <ul style="list-style-type: none"> · Metric units · Time (12/24 hour) · Roman numerals (Arabic/Roman) · Temp (C/F) · Apothecary <p>4.2 Instruments</p>

<p>and geometric modeling.</p> <p>4.4 Understand measurable attributes of objects and the units, systems, and processes of measurement.</p>	<ul style="list-style-type: none"> · IV, flow rates · Macro/micro drops (tubing) · Syringes · Rulers, tape measures · Scales · Goniometry, ROM · Centrifuges · Sphygmomanometer gauges · Pulse oximeters, oxygen flow rates · Thermometers
Standard 5: Interpreting Data	
<p>5.1 Formulate and answer questions by collecting, organizing, and analyzing data.</p> <ol style="list-style-type: none"> a. Collect, record, organize, and display a set of data. b. Determine whether the pattern of the data is linear or nonlinear when given in a list, table, or graph. c. Interpret the correlation between two variables as positive, negative, or having no correlation. d. Find a line of best fit by estimation, choosing two points, or using technology for a given set of data. e. Analyze the meaning of the slope and y-intercept of a line of best fit as it relates to the data. f. Make predictions based on a line of best fit. g. Find mean, median, mode, and range for a data set. h. Analyze the meaning of the maximum or minimum and intercepts of the regression equation as they relate to a given set of bivariate data. i. Make predictions and estimations and determine their reasonableness using a regression equation. <p>5.2 Apply basic concepts of probability.</p> <ol style="list-style-type: none"> a. Determine and express the probability of an event as a fraction, percent, ratio, or decimal. <p>5.3 Evaluate, solve, and analyze mathematical situations,</p>	<p>5.1 Graphs and charts</p> <ul style="list-style-type: none"> · Interpreting charts and graphs · Temperature, pulse, respirations graphs · Intake and output charts · Height, weight, measurement graphics · Cardiac output · Medication errors · Census · Acutities · Disease, mortality rates · Job outlook, projections · Treatments · Differential diagnosis · Health care costs · Effectiveness (facilities, providers) · Wellness indicators · Reliability and Validity · Body mass index · Statistics · Epidemiology

<p>using algebraic properties and symbols.</p> <p>a. Solve systems of two linear equations or inequalities:</p> <ul style="list-style-type: none"> · Numerically; e.g., from a table · Algebraically · Graphically · Using technology <p>5.4 Identify relationships among real numbers and operations involving these numbers.</p> <p>a. Identify matrices that can be added, subtracted, or multiplied.</p> <p>b. Demonstrate that matrix multiplication is not commutative.</p>	
<p>Standard 6: Math for Medications</p>	
<p>6.1 Compute fluently and make reasonable estimates.</p> <p>6.2 Evaluate, solve, and analyze mathematical situations using algebraic properties and symbols.</p> <p>a. Simplify and evaluate numerical expressions (including integer exponents and square roots), algebraic expressions, formulas, and equations.</p> <p>6.3 Represent quantitative relationships using mathematical models and symbols.</p>	<p>6.1 Reading drug labels and prescriptions</p> <p>6.2 Using medical reference books to determine if calculated dosages are safe</p> <p>6.3 Dosing</p> <p>6.4 Patient instructions</p>
<p>Standard 7: Medical Accounting and Business</p>	
<p>7.1 Compute fluently and make reasonable estimates.</p> <p>7.2 Represent real numbers in a variety of ways.</p> <p>7.3 Identify relationships among real numbers and operations involving these numbers.</p> <p>7.4 Evaluate, solve, and analyze mathematical situations using algebraic properties and symbols.</p>	<p>7.1 Numerical filing</p> <p>7.2 Appointment scheduling</p> <p>7.3 Calculating cash transactions</p> <p>7.4 Maintaining accounts</p> <p>7.5 Checks, deposit slips, and receipts</p> <p>7.6 Paycheck calculation</p> <p>7.7 Budgeting</p> <p>7.8 Depreciation, Amortization</p> <p>7.9 Insurance</p>
<p>Standard 8: Exponents and Logarithms</p>	
<p>8.1 Evaluate, solve, and analyze mathematical situations</p>	<p>8.1 Radiation exposure</p>

using algebraic properties and symbols. 8.2 Determine measurements using appropriate techniques, tools, and formulas. 8.3 Use properties of logarithms and exponents to solve equations.	8.2 Half life 8.3 pH 8.4 Research data
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