STRANDS AND STANDARDS
MEDICAL MATH

Learning that works for Utah
CTE®

Course Description

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.

Intended Grade Level	11-12
Units of Credit	0.5
Core Code	36.01.00.00.150
Concurrent Enrollment Core Code	N/A
Prerequisite	Secondary Math 2 PLUS a Health Science Course
Skill Certification Test Number	
Test Weight	
License Area of Concentration	CTE and/or Secondary Education 6-12
Required Endorsement(s)	
Endorsement 1	Medical Math
Endorsement 2	
Endorsement 3	

STRAND 1

Uses of Mathematics in Healthcare

Standard 1

Analyze the use of medical mathematics in the healthcare system.
- Explore different healthcare careers and the math used within the career.
- Compare and contrast at least two different careers.

Strand 1 Performance Skill listed below

STRAND 2

Common Mathematical Operations as Used in Healthcare

Standard 1

Compute fluently and make reasonable estimates.
- Evaluate and simplify numerical expressions containing rational numbers using the order of operations.
- Compute solutions to problems and determine the reasonableness of an answer by relating them to applied scenarios
- Whole numbers
  - Supplies and inventories
  - Intake and output
  - Cholesterol
  - Quantities
  - Nutrition
  - Vital signs labs
  - Lever systems
  - Laboratory Values

Standard 2

Represent rational numbers in a variety of ways.
- Choose appropriate and convenient forms of rational numbers for solving problems and representing
- answers (e.g., decimal, fraction, or percent).
- Compute solutions to problems and determine the reasonableness of an answer by relating them
- to applied scenarios.
- Decimals:
  - Tools, instruments
  - Nutrition
  - Weights
  - Rounding
  - Temperature
  - EKG's
  - Medications
  - Laboratory values

Standard 3

Identify relationships among rational numbers and operations involving these numbers.
- Compute solutions to problems and determine the reasonableness of an answer by relating them to applied scenarios.
- Fractions
  - Tools, instruments
  - Weights
  - Estimation
  - EKG's
  - Medications
  - Laboratory values
  - Conversions (Fahrenheit/Celsius)

Standard 4

Calculate percentages.
- Compute solutions to problems and determine the reasonableness of an answer by relating them
- to applied scenarios.
- Compute solutions to problems and determine the reasonableness of an answer by relating them
- to applied scenarios.
  - Chemical solutions
  - Laboratory values
  - Growth charts
  - Medications
  - Nutrition
  - Intake/output
  - Target heart rate
  - Stroke volume
  - Cardiac output
  - Blood loss
  - Body surface area, burns
  - Oxygen saturation

STRAND 3

Ratios and Proportions

Standard 1

Evaluate, solve, and analyze mathematical situations using algebraic properties and symbols.
- Solve proportions that include algebraic first-degree expressions (solve for x or use dimensional analysis).
  - Nutrition
  - Chemical solutions
  - Dosage conversions

Standard 2

Use ratios to compare data.
- Laboratory values

- Medications
- Diseases (statistics)analysis).

STRAND 4

Gathering Data (Use of Medical Instruments)

Standard 1

Use patterns, relations, and functions to represent mathematical situations.
- Compute solutions to problems and determine the reasonableness of an answer by relating them to applied scenarios.
  - Conversions
  - Metric units
  - Time (12/24)
  - Roman numerals (Arabic/Roman)
  - Temperature (Celsius/Fahrenheit)
  - Pre/Post workout weight analysis
  - Body composition
  - Pharmacology

Standard 2

Represent quantitative relationships using mathematical models and symbols.
- Find and interpret rates of change by analyzing graphical and numerical data.
- Understand measurable attributes of objects and the units, systems, and processes of measurement.
- Solve problems using visualization and spatial reasoning.
- Instruments
  - IV flow rates
  - Macro/micro drops (tubing)
  - Syringes
  - Rulers, tape measures
  - Scales
  - Goniometry, ROM
  - Centrifuges
  - Sphygmomanometer gauges (blood pressure)
  - Pulse oximeters
  - Oxygen flow rates
  - Thermometers

STRAND 5

Interpreting Data

Standard 1

Formulate and answer questions by collecting, organizing, and analyzing statistical data.
- Collect, record, organize, and display a set of statistical data.
- Determine whether the pattern of the data is linear or nonlinear when given in a list, table, or graph.

- Interpret the correlation between two variables as positive, negative, or having no correlation.
- Find a line of best fit by estimation, choosing two points, or using technology for a given set of statistical data.
- Analyze the meaning of the slope and y-intercept of a line of best fit as it relates to the statistical data set.
- Find mean, median, mode, and range for a statistical data set.
- Analyze the meaning of the maximum or minimum and intercepts of the regression equation as they relate to a given set of bivariate data.
- Make predictions and estimations and determine their reasonableness using a regression equation (line of best fit).
- Graphs and charts
  - Interpreting charts and graphs
  - Temperature, pulse, respiration graphs
  - Intake and output charts
  - Height, weight, measurement graphs
  - Cardiac output
  - Medication errors
  - Census
  - Acuities
  - Disease, mortality rates
  - Job outlook, projections
  - Treatment prognosis
  - Clinical trials
  - Healthcare costs
  - Effectiveness (facilities, providers)
  - Wellness indicators
  - Reliability and validity
  - Body mass index (BMI)
  - Body composition
  - Epidemiology

Standard 2

Apply basic concepts of probability.
- Determine and express the probability of an event as a fraction, percent, ratio, or decimal.
- Determine the conditional probability of an event (false positive/false negative).

STRAND 6

Math for Medications

Standard 1

Compute fluently and make reasonable estimates.
- Reading drug labels
- Interpreting prescriptions/Patient instructions

Standard 2

Evaluate, solve, and analyze mathematical situations using algebraic properties and symbols.
- Simplify and evaluate numerical expressions (including integer exponents and square roots), algebraic expressions, formulas, and equations.
- Using medical reference materials to determine if calculated dosages are safe.

Standard 3

Represent quantitative relationships using mathematical models and symbols.
- Dosing
- Dosage conversions

STRAND 7

Medical Accounting and Business

Standard 1

Apply systems of order.
- Numerical filing
- Appointment scheduling

Standard 2

Evaluate, solve, and analyze mathematical situations using algebraic properties and symbols.
- Maintaining accounts
- Checks, deposit slips, and receipts
- Calculating cash transactions/Payroll
- Budgeting
- Depreciation, amortization
- Insurance

STRAND 8

Exponents and Logarithms

Standard 1

Use properties of exponentials to solve equations.
- Radiation exposure
- Half life

Standard 2

Use properties of logarithms to solve equations.
- pH

Performance Skills

- Oral presentation on chosen healthcare career mathematics.
- Use healthcare career choice to create a business model.

Workplace Skills

- Critical thinking
- Collaboration
- Communication (Oral/Written)
- Organization
- Technical skills
- Consumer awareness
- Commercial awareness
- Legal requirements/ expectations
- Interpersonal relationships