

MATH M19: MATH FOR HEALTH SCIENCES

Originator

pabramoff

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College

Moorpark College

Attach Support Documentation (as needed)

MATH M19_state approval letter_CCC000624724.pdf

Discipline (CB01A)

MATH - Mathematics

Course Number (CB01B)

M19

Course Title (CB02)

Math for Health Sciences

Banner/Short Title

Math for Nursing Science

Credit Type

Credit

Start Term

Fall 2023

Catalog Course Description

Covers ratios, fractions, decimals and percents. Includes unit conversions, metric and household abbreviations, use of formulas, proportion and unit simplification. Coaches how to perform mental estimations and mental calculations.

Additional Catalog Notes

May be taken before entrance to the Nursing Program or after acceptance to the Nursing Program.

Taxonomy of Programs (TOP) Code (CB03)

1702.00 - Mathematics Skills

Course Credit Status (CB04)

D (Credit - Degree Applicable)

Course Transfer Status (CB05) (select one only)

C (Not transferable)

Course Basic Skills Status (CB08)

N - The Course is Not a Basic Skills Course

SAM Priority Code (CB09)

E - Non-Occupational

Course Cooperative Work Experience Education Status (CB10)

N - Is Not Part of a Cooperative Work Experience Education Program

Course Classification Status (CB11)

Y - Credit Course

Educational Assistance Class Instruction (Approved Special Class) (CB13)

N - The Course is Not an Approved Special Class

Course Prior to Transfer Level (CB21)

Y - Not Applicable

Course Noncredit Category (CB22)

Y - Credit Course

Funding Agency Category (CB23)

Y - Not Applicable (Funding Not Used)

Course Program Status (CB24)

2 - Not Program Applicable

General Education Status (CB25)

Y - Not Applicable

Support Course Status (CB26)

N - Course is not a support course

Field trips

Will not be required

Grading method

(L) Letter Graded

Alternate grading methods

(O) Student Option- Letter/Pass

(P) Pass/No Pass Grading

Does this course require an instructional materials fee?

No

Repeatable for Credit

No

Is this course part of a family?

No

Units and Hours

Carnegie Unit Override

No

In-Class

Lecture

Minimum Contact/In-Class Lecture Hours

17.5

Maximum Contact/In-Class Lecture Hours

17.5

Activity**Laboratory****Total in-Class****Total in-Class****Total Minimum Contact/In-Class Hours**

17.5

Total Maximum Contact/In-Class Hours

17.5

Outside-of-Class**Internship/Cooperative Work Experience****Paid****Unpaid****Total Outside-of-Class****Total Outside-of-Class****Minimum Outside-of-Class Hours**

35

Maximum Outside-of-Class Hours

35

Total Student Learning**Total Student Learning****Total Minimum Student Learning Hours**

52.5

Total Maximum Student Learning Hours

52.5

Minimum Units (CB07)

1

Maximum Units (CB06)

1

Prerequisites

Intermediate Algebra or placement as determined by the college's multiple measures assessment process.

Entrance Skills**Entrance Skills**

- graph and interpret linear and quadratic functions.
- analyze and solve various equations, inequalities, and systems of equations

Requisite Justification**Requisite Type**

Prerequisite

Requisite

Intermediate Algebra or placement as determined by the college's multiple measures assessment process.

Requisite Description

Other (specify)

Specify Other Requisite Description

Intermediate Algebra is a requirement for admission to the nursing program. It is assumed that students will have completed the equivalent course before enrolling in this course.

Level of Scrutiny/Justification

Content review

Student Learning Outcomes (CSLOs)

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

- | | |
|---|--|
| 1 | perform a conversion of volume or weight measurement from one unit to another within the metric system and solve for the proper value in a ratio or proportion equation. |
| 2 | estimate a measurement given certain conditions without the use of a calculator. |

Course Objectives

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

- | | |
|----|---|
| 1 | simplify fractions, ratios, and proportions. |
| 2 | evaluate and round decimals. |
| 3 | convert measurements within the metric system and the household system. |
| 4 | compute proper liquid measurements. |
| 5 | apply proper abbreviations to metric measurements. |
| 6 | apply proper abbreviations to household measurements. |
| 7 | determine proper measurements using ratios and proportions. |
| 8 | determine proper measurements using dimensional analysis. |
| 9 | convert differing measurements to the same weight measure. |
| 10 | clear decimals within fractions. |
| 11 | identify and order special types of oral solids and liquids. |
| 12 | estimate measurements without the use of a calculator. |
| 13 | perform mental calculations without the use of a calculator. |

Course Content**Lecture/Course Content****25% A. Arithmetic Needed for Dosage**

1. Fractions
2. Decimals and Decimal rounding rules
3. Percents
4. Fractions, Ratios and Proportions

25% B. Metric and Household Systems of Measurement

1. Metric System (volume and weight conversions only, no linear conversions)
2. Household System
3. Liquid Measures
4. Other Conversions

10% C. Drug Abbreviations, Labels and Packaging

1. Metric and SI Abbreviations
2. Household Abbreviations

40% D. Calculations of Oral Medications-Solids and Liquids (Introduction to Formulas, Proportion and Dimensional Analysis)

1. Oral Solids (Formula Method, Proportion, Dimensional Analysis)
2. Converting Order and Supply to the Same Weight Measure
3. Clearing Decimals (within Fractions and Unit Simplification)
4. Special Types of Oral Solid Orders
5. Oral Liquids (Formula Method, Proportion, Dimensional Analysis)

6. Special Types of Oral Liquid Orders
7. Common Sense Calculations (Mental Estimations and Mental Calculations)

Laboratory or Activity Content

n/a

Methods of Evaluation

Which of these methods will students use to demonstrate proficiency in the subject matter of this course? (Check all that apply):

Written expression
 Problem solving exercises
 Skills demonstrations

Methods of Evaluation may include, but are not limited to, the following typical classroom assessment techniques/required assignments (check as many as are deemed appropriate):

Computational homework
 Individual projects
 Objective exams
 Problem-solving exams
 Problem-solving homework
 Quizzes
 Other (specify)

Other

Quizzes and graded work will be used to evaluate students for the critical thinking skills needed to solve math problems. Problems must require students to demonstrate analytic skills and the step-by-step details required for the solution.

Instructional Methodology

Specify the methods of instruction that may be employed in this course

Class activities
 Class discussions
 Collaborative group work
 Demonstrations
 Distance Education
 Group discussions
 Instructor-guided interpretation and analysis
 Lecture
 Problem-solving examples
 Other (specify)

Specify other method of instruction

All instructors will use best practices to provide an inclusive learning environment that respects all forms of racial, ethnic, age, and gender diversity, and provides for the individual needs of students of all learning styles.

Describe specific examples of the methods the instructor will use:

1. Use of whiteboard or overhead projector to demonstrate solutions to calculations, such as converting measurements within the metric system and the household system.
2. In-class group activities, such as guided practice on solving various types of arithmetic problems and measurement systems.
3. Class discussions with student response, such as discussing how to use formulas, proportions, and dimensional analysis.

Representative Course Assignments

Writing Assignments

1. Stating the answer to a mathematical problem in any of various forms, such as stating the answer to a ratio or proportion problem.
2. Writing a short answer explaining the result of a conversion of one metric measurement to another.
3. Writing the interpretation of an answer to a mathematical computation, such as indicating the accuracy of a mental estimation.

Critical Thinking Assignments

1. Interpret and describe the meaning of the solution to a mathematical application problem, such as an applying ratios and proportions to the computations of oral medication dosage.
2. Compare and contrast methods of solving a mathematical problem, such as when to clear fractions, set up a proportion, or use unit fractions to determine a measurement.

Reading Assignments

1. Reading concepts from the textbook, such as the differences between the metric system and household measurements.
2. Reading instructor created materials, such as a prepared handout describing oral liquid medications and oral solid medications.
3. Reading resource materials from the library or online concerning the importance of determining proper dosage measurements.

Skills Demonstrations

1. Demonstrate understanding the meaning of an answer, such as the application of a metric system measurement to the amount of active ingredient in an oral medication.
2. Perform a mental estimate of a measurement given certain conditions within a certain given accuracy.

Problem-Solving and Other Assignments (if applicable)

1. Graded problem-solving assignments, such as practice on operations on fractions, decimals, ratios and proportions.
 1. Describe and analyze the steps in solving a problem, such as identifying the steps in solving a dimensional analysis problem.

Outside Assignments**Representative Outside Assignments**

1. Reading assignments from the textbook, such as identifying and understanding the different unit measurements for volume and weight, in the Metric system, and household measurements.
2. Additional research assignments from library resources or internet articles on the importance of accuracy in the administering the correct dosage of various medications.

Articulation**Equivalent Courses at other CCCs**

College	Course ID	Course Title	Units
Riverside Community College	NRN-93	Calculations for Health Care Providers	1
College of San Mateo	NURS 610	Basic Medication Dosage Calculations for Nurses	1
West Hills College Lemoore	HS 090	Medical Mathematics	2

District General Education**A. Natural Sciences****B. Social and Behavioral Sciences****C. Humanities****D. Language and Rationality****E. Health and Physical Education/Kinesiology****F. Ethnic Studies/Gender Studies****CSU GE-Breadth****Area A: English Language Communication and Critical Thinking****Area B: Scientific Inquiry and Quantitative Reasoning****Area C: Arts and Humanities****Area D: Social Sciences****Area E: Lifelong Learning and Self-Development****Area F: Ethnic Studies****CSU Graduation Requirement in U.S. History, Constitution and American Ideals:****IGETC****Area 1: English Communication****Area 2A: Mathematical Concepts & Quantitative Reasoning****Area 3: Arts and Humanities****Area 4: Social and Behavioral Sciences****Area 5: Physical and Biological Sciences****Area 6: Languages Other than English (LOTE)****Textbooks and Lab Manuals****Resource Type**

Textbook

Classic Textbook

Yes

DescriptionBoyer, Mary Jo. *Math For Nurses: A Pocket Guide to Dosage Calculation and Drug Preparation*. 10th ed., Wolters Kluwer, 2019.**Resource Type**

Textbook

Classic Textbook

Yes

Description

Buchholz, Susan. *Henke's Med-Math: Dosage Calculation, Preparation, & Administration*. 9th ed., Wolters Kluwer, 2019.

Resource Type

Textbook

Classic Textbook

No

Description

Hassen, Chase, and Bradley J. Wojcik. *Dosage Calculations for Nursing Students*. 2nd ed., Independent Publishing, 2019.

Resource Type

Textbook

Description

Yoder, Carol. *Medical Math & Dosage Calculations for the Health Care Worker, Part 2*. E-book, Skills Commons (Norwalk Community College), 2016, <https://moodle.skillscommons.org/course/view.php?id=151>. Accessed 13 Oct 2022.

Library Resources**Assignments requiring library resources**

Use of textbooks on reserve at Circulation Desk. Projects involving use of library resources to investigate applications of the metric system, household system, conversions or other related topics.

Sufficient Library Resources exist

Yes

Example of Assignments Requiring Library Resources

Research assignments utilizing library resources on the importance of accuracy in administering the correct dosage of various medications.

Distance Education Addendum**Definitions****Distance Education Modalities**

Hybrid (1%–50% online)
Hybrid (51%–99% online)
100% online

Faculty Certifications

Faculty assigned to teach Hybrid or Fully Online sections of this course will receive training in how to satisfy the Federal and state regulations governing regular effective/substantive contact for distance education. The training will include common elements in the district-supported learning management system (LMS), online teaching methods, regular effective/substantive contact, and best practices.

Yes

Faculty assigned to teach Hybrid or Fully Online sections of this course will meet with the EAC Alternate Media Specialist to ensure that the course content meets the required Federal and state accessibility standards for access by students with disabilities. Common areas for discussion include accessibility of PDF files, images, captioning of videos, Power Point presentations, math and scientific notation, and ensuring the use of style mark-up in Word documents.

Yes

Regular Effective/Substantive Contact

Hybrid (1%–50% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Use of student discussion boards to discuss concepts from the material, solutions to homework problems, general discussion of techniques in solving problems, study skills, or arranging study groups.
E-mail	Responding to student queries about material, grade information, course policies and procedures, scheduling and due dates, submitting homework assignments, or making general announcements to the class.
Face to Face (by student request; cannot be required)	Students requesting to speak to instructor in person for personal help on material, grade information, or discussion of policies and procedures.
Other DE (e.g., recorded lectures)	Posting of recorded lectures either by the instructor, recorded lessons available through campus resources, or use of public online resources available on the internet.
Synchronous Dialog (e.g., online chat)	Active live discussion with the instructor on material concepts, techniques for problem solving, feedback on solutions to problems, general chat on study skills, or answers to homework problems, quizzes or tests.

Hybrid (51%–99% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Use of student discussion boards to discuss concepts from the material, solutions to homework problems, general discussion of techniques in solving problems, study skills, or arranging study groups.
E-mail	Responding to student queries about material, grade information, course policies and procedures, scheduling and due dates, submitting homework assignments, or making general announcements to the class.
Face to Face (by student request; cannot be required)	Students requesting to speak to instructor in person for personal help on material, grade information, or discussion of policies and procedures.
Other DE (e.g., recorded lectures)	Posting of recorded lectures either by the instructor, recorded lessons available through campus resources, or use of public online resources available on the internet.
Synchronous Dialog (e.g., online chat)	Active live discussion with the instructor on material concepts, techniques for problem solving, feedback on solutions to problems, general chat on study skills, or answers to homework problems, quizzes or tests.

100% online Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Use of student discussion boards to discuss concepts from the material, solutions to homework problems, general discussion of techniques in solving problems, study skills, or arranging study groups.
E-mail	Responding to student queries about material, grade information, course policies and procedures, scheduling and due dates, submitting homework assignments, or making general announcements to the class.
Other DE (e.g., recorded lectures)	Posting of recorded lectures either by the instructor, recorded lessons available through campus resources, or use of public online resources available on the internet.
Synchronous Dialog (e.g., online chat)	Active live discussion with the instructor on material concepts, techniques for problem solving, feedback on solutions to problems, general chat on study skills, or answers to homework problems, quizzes or tests.

Examinations

Hybrid (1%–50% online) Modality

On campus

Hybrid (51%–99% online) Modality

On campus

Primary Minimum Qualification

MATHEMATICS

Review and Approval Dates

Department Chair

10/14/2022

Dean

10/17/2022

Technical Review

10/20/2022

Curriculum Committee

11/01/2022

DTRW-I

MM/DD/YYYY

Curriculum Committee

MM/DD/YYYY

Board

MM/DD/YYYY

CCCCO

MM/DD/YYYY

Control Number

CCC000624724

DOE/accreditation approval date

MM/DD/YYYY