COURSE INFORMATION

COURSE TITLE:
MAT103: Math for Clinical Calculations

COURSE DESCRIPTION:
Provides a review of general mathematics, introductory algebra and an opportunity to learn systems of measurement and methods of solving problems related to drug dosage and intravenous fluid administration. It is designed for students in the health disciplines. Topics may include algebra, graphs, measurement and conversion between various systems of measurement.

CREDIT HOURS:
3

PREREQUISITE INFORMATION:
MAT050 or assessment test. Contact your home college to determine which placement test they are using and/or for additional information.

CCCOnline Course Policies
The CCCOnline Course Policies page contains information about the student’s role in the classroom, grading policies, and rights and responsibilities.
COURSE MATERIALS

Your textbook is available online as an eText. You are not required to purchase the textbook. For specific information on refund policies and the optional black and white textbook available for purchase please contact the CCCOnline bookstore (link opens in new window).

MINIMUM COMPUTER REQUIREMENTS

To complete this course, you will need regular access to a computer from which you can get to the Internet and use email. In order to ensure that your course functions properly, you must run the System Check. This is a CRITICAL STEP, and taking the time to do it now will eliminate a tremendous amount of frustration for you later. To run the System Check, click Tools in the course NavBar and then click System Check.

REQUIRED ETEXT

Main eText


Digital Materials Access and Setup

This course uses MyLabsPlus which contains the eText in addition to interactive media content to help you remember what you learn.

- Visit the Pearson MyLabsPlus Course Start page for details on first access of the materials.

To make sure your computer is set up correctly to access the e-Book and other digital content, review the Pearson Technical Support page, also linked in the Technical Support Module.

In addition, there is one module (Module 2) using NROC digital material and assessment tools.

OTHER REQUIRED MATERIALS

A basic four-function (+, -, X, ÷) calculator with a square root key is needed for the course.
COURSE COMPETENCIES AND OUTCOMES

STUDENT COMPETENCIES:

The competencies you will demonstrate in this course are as follows:

A. Demonstrate knowledge and use of ratios, proportions, and percents.
B. Demonstrate knowledge and use of units of measure including metric, apothecary & household.
C. Demonstrate knowledge and use of algebraic operations.
D. Demonstrate knowledge and use of algebraic equations and formulas.
E. Demonstrate ability to calculate drug dosages from prescribed dosage & drug label information for oral medications.
F. Demonstrate ability to calculate drug dosages from prescribed dosage & drug label information for injectable medications.
G. Demonstrate knowledge and use of the steps in calculating drug dosage ranges for pediatric patients using various methods.
H. Demonstrate ability to calculate intravenous infusion rates of a drug for concentration and volume per unit time.
I. Demonstrate ability to calculate intravenous infusion rates of a drug for specific body weight per unit time.
J. Demonstrate ability to calculate intravenous infusion rates of a drug for specific body weight per unit time.

The module outcomes that will permit you to demonstrate course competencies are:

**MODULE 1**

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Write the comparison of two numbers by means of a ratio.</td>
<td>A</td>
</tr>
<tr>
<td>2  Write a ratio as a fraction, a decimal numeral or a unit ratio.</td>
<td>A</td>
</tr>
<tr>
<td>3  Solve a proportion.</td>
<td>A</td>
</tr>
<tr>
<td>4  Identify, set up, and solve applications that are directly and</td>
<td></td>
</tr>
<tr>
<td>indirectly proportional.</td>
<td>A</td>
</tr>
<tr>
<td>5  Convert fractions and decimal numbers to percent numbers and vice versa.</td>
<td>A</td>
</tr>
<tr>
<td>6  Solve rate/base/percentage problems.</td>
<td>A</td>
</tr>
<tr>
<td>7  Identify required information (i.e. generic name, dosage strengths, etc.) from oral medication drug labels.</td>
<td>E</td>
</tr>
<tr>
<td>8  Identify required information (i.e. generic name, dosage strengths, etc.) from parenteral medication drug labels.</td>
<td>F</td>
</tr>
</tbody>
</table>
### Module 2

**Outcomes**
1. Identify, set up, and solve applications that are directly or indirectly proportional.  
2. Identify significant digits as well as numbers that are accurate and/or precise.  
3. Round numbers off correctly depending on the accuracy or precision required.  
4. Convert temperature measurements between degrees C and degrees F.  
5. Identify, add and subtract “like terms” and apply the distributive law.  
6. Multiply and divide monomials.  
7. Solve and check linear equations, including those containing grouping symbols and fractions.  
8. Evaluate and solve formulas.  
9. Analyze line, bar, circle and coordinate plane graphs to interpret data.

**Competencies**

A  
B  
B  
B  
C  
D  
D  
E

### Module 3

**Outcomes**
1. Calculate medication dosages by applying dimensional analysis method while using proper terms from the household or metric system.  
2. Discuss and use units of measurement in the household and metric systems.  
3. Convert within and between household and metric systems.

**Competencies**

B  
B  
B

### Module 4

**Outcomes**
1. Solve problems specifically related to solid, liquid, and parenteral/injectable forms of medications.  
2. Identify required information (i.e. generic name, dosage strengths, etc.) from parenteral medication drug labels.  
3. Calculate dosages for solid and liquid forms of oral medication as well as for parenteral solutions.  
4. Interpret instructions for reconstitution of parenteral solutions.

**Competencies**

F, G  
F, G  
F, G  
G

### Module 5

**Outcomes**
1. Identify steps in calculating drug dosage ranges for pediatric patients.  
2. Apply Body Surface Area formulas and Body Weight rules.  
3. Calculate intravenous flow rates in mL/h and gtt/min.  
4. Calculate infusion times and volumes.  
5. Calculate infusion rates in mL/h, units/h, and mL/min.  
6. Calculate intravenous flow rates according to mcg/kg/h and mg/kg/min.

**Competencies**

H  
H  
I  
I  
I  
J
GRADING AND EVALUATION

METHODS:

Evaluation includes a combination of discussion participation, assignments, and other evaluations. Rubrics will be provided for assignments and discussions.

GRADING POLICIES:

Mark all Module due dates on your calendar for this class. You may submit assignments AHEAD of schedule. Late assignments will not be accepted without prior approval.

SUMMARY OF GRADING

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Nursing Discussions (4 @ 10 points each)</td>
<td>40</td>
<td>4%</td>
</tr>
<tr>
<td>Do the Math Discussions (13 @ 10 points each)</td>
<td>130</td>
<td>13%</td>
</tr>
<tr>
<td>Chapter Study Plan &quot;Post Test&quot; Quizzes (11 @ 20 points each, 1 @ 10 points)</td>
<td>230</td>
<td>23%</td>
</tr>
<tr>
<td>Module Exams (5 @ 80 points each)</td>
<td>400</td>
<td>40%</td>
</tr>
<tr>
<td>Module 5 General Nursing Discussion: Nurse Interview</td>
<td>40</td>
<td>4%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>160</td>
<td>16%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1000</td>
<td>100%</td>
</tr>
</tbody>
</table>

Grading Scale

A = 90 to 100%  B = 80 to 89%  C = 70 to 79%  D = 60 to 69%  F = 59% and below

DISCUSSIONS

Participation in Discussions is a very important part of this class experience and cannot be made up after each week's Discussion ends. Discussions are where we discuss the readings and benefit from each class member's contributions and questions. There will be at least three to four Discussion topics per Module. I'll expect you to respond with your own thoughts, and also respond to your classmates' postings. You will be expected to offer helpful comments as you can. Remember that you are expected to use proper netiquette in your communications. See the CCCOnline Mutual Respect Policy for more information. Expect to post at least 1-2 times at a detailed level in each section that has a Discussion component. These do count for points and factor into your final grade.

- The **Introduction** is worth at most 5 points of extra credit for the initial post.
- **General Nursing Discussions** are worth up to 10 points total. Each of the General Nursing Discussions requires two posts per discussion minimum. Your initial post should directly address the topic of the Discussion. This post can earn up to 8 points.
The remaining posts should be replies to other students. This can earn 2 points for your peer response that addresses specifics in another student’s initial post. Also, replies made to me (the instructor) are not considered a peer reply.

- For the **Do the Math Discussions**, you will select one of the given exercises. Select an exercise that has not already been worked. You will copy this exercise in your initial Discussion post, show your work in finding the answer, and explain your steps. Each of the Do the Math Discussions requires two posts per discussion minimum, 1 initial post, and replies to other students. Do the Math Discussions are worth up to 8 points for your initial post and 2 points for a peer response that addresses specifics in another student’s initial post.

- The **goodbye post** with a link to a helpful website for math or nursing is worth at most 5 points of extra credit.

**STUDY PLAN HOMEWORK ASSIGNMENTS**

For most weeks you will have a Study Plan (Homework) Assignment to complete within MyLabsPlus. Study Plans include a pretest, Study Material Readings and Quizzes, and a posttest. Your grade on the posttest counts as a homework grade. While the Study Plans are not individually graded, they are required and they include the graded Chapter Quizzes and Module Exams. Be sure to print the Class Schedule (also located in the Start Here! Module) and keep track of the weekly tasks and deadlines.

**CHAPTER STUDY PLAN QUIZZES**

For each chapter in the textbook, you will have a Study Plan (Homework) Assignment in MyNursingLab.

- First, you will take the Chapter Pretest. You will have one attempt and need to complete all questions in one sitting. The Pretest will be composed of topics from that chapter. Each topic will be assessed.
  - If you score an 80% or higher on a topic in the Pretest, then you will not have to do Study Material on that topic.
  - If you score less than 80% on a topic, you will have access to both a Topic Quiz and a Topic Link. You should access the link to review the material from the ebook and then take the topic quiz.
  - You should score at least 80% on each topic. Once you have received an 80% on each Topic Quiz in the Study Material, then you should take the Chapter Posttest.
• You should score at least an 80% on the Chapter Posttest. If you do not score at least 80% the first time, you should review the Study Material again and then retake the Chapter Posttest.

To earn the points for each Chapter Study Plan, you must complete the Chapter Post-test with at least an 80%. If you do so, you will earn the full 20 points for Chapters 1 to 6 and 8 to 12. The Chapter 7 Study Plan is worth 10 points. If you score less than an 80%, you will receive 0 points.

MODULE AND FINAL EXAMS

You will access the Exams for Modules 1, 2, 3, 4 and 5 in MyLabsPlus.

• You will have one attempt and 120 minutes to complete the 11 questions for each Exam.
• Your score on the Module Exams will be copied to the D2L grade book.
• Each Module Exam will count for at most 80 points.

You will also access the Final Exam in MyLabsPlus.

• You will have one attempt and 3 hours to complete it.
• There are 22 questions on the Final Exam, which is worth at most 160 points.

You will have questions in which you will need to show your work and write a sentence, as in the Do the Math Discussion. You will have 6 “show your work” questions and 5 multiple-choice questions in each of the Module Exams. You will have 12 “show your work” questions and 10 multiple-choice questions in the Final Exam.

REVIEW QUESTIONS

There is a set of review questions in the form of a quiz for each module and the final review to help you prepare for the Module and Final Exams. There will be 11 questions in each of the Module Reviews and 22 questions in the Final Review. These are ungraded activities but will help you as you study for the graded exams.

EXTRA CREDIT

Students may receive up to 5 points of extra credit each for their initial introduction discussion and for their goodbye post in which a link to a helpful website is given.
**COURSE SCHEDULE**

The Schedule is subject to change as needed.

This page summarizes all of the graded assignments, exams, and reading assignments for the course. If you want, you can print it out and post it somewhere handy.

All assignments are described in detail on the Module assignment pages. If you have questions check there and/or send me an e-mail.

**This course is not self-paced and is not open-exit.** All assignments, papers, quizzes, discussions, etc., are to be completed by no later than 11:59 pm MST/MDT of the due date.

NOTE: Important CCCOnline semester dates (e.g., drop/withdraw/term end) appear on the [CCCOnline calendar](#).

**MODULE 1**

**Reading/Assignments/Exams**

<table>
<thead>
<tr>
<th>Participate:</th>
<th>Due Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction Discussion (Extra Credit)</td>
<td></td>
</tr>
<tr>
<td>Read/Review:</td>
<td></td>
</tr>
<tr>
<td>• Chapter 1 in MyLabsPlus</td>
<td></td>
</tr>
<tr>
<td>• Exploration 1</td>
<td></td>
</tr>
<tr>
<td>• Chapter Powerpoint slides in MyLabsPlus</td>
<td></td>
</tr>
<tr>
<td>Complete: Study Plan for Chapter 1 in MyLabsPlus (including any graded Study Material Quizzes)</td>
<td></td>
</tr>
<tr>
<td>Participate:</td>
<td></td>
</tr>
<tr>
<td>Do the Math Discussion: Chapter 1 (initial post is due the Friday before the deadline)</td>
<td></td>
</tr>
<tr>
<td>Read/Review:</td>
<td></td>
</tr>
<tr>
<td>• Chapter 2 in MyLabsPlus</td>
<td></td>
</tr>
<tr>
<td>• Exploration 2</td>
<td></td>
</tr>
<tr>
<td>• Chapter Powerpoint slides in MyLabsPlus</td>
<td></td>
</tr>
<tr>
<td>Complete: Study Plan for Chapter 2 in MyLabsPlus (including any graded Study Material Quizzes)</td>
<td></td>
</tr>
<tr>
<td>Participate:</td>
<td></td>
</tr>
<tr>
<td>Do the Math Discussion: Chapter 2 (initial post is due the Friday before the deadline)</td>
<td></td>
</tr>
<tr>
<td>Participate:</td>
<td></td>
</tr>
<tr>
<td>General Nursing Discussion: Nurse to Patient Ratios (initial post is due the Friday before the deadline)</td>
<td></td>
</tr>
<tr>
<td>Complete: Module 1 Exam in MyLabsPlus</td>
<td></td>
</tr>
</tbody>
</table>
MODULE 2

Reading/Assignments/Exams

Read/Review:
- Exploration
- Concepts in Statistics Sub-Module
- Unit 8 Glossary

Complete the Concepts in Statistics Sub-Module

Read/Review: Solving Equations and Inequalities Sub-Module
- Unit 10 Glossary
- Beginning Algebra Course Text
- Unit 10 - Lesson 1: Topics 1, 2, 4
- Unit 10 - Lesson 2: Topic 1

Complete the Solving Equations and Inequalities Sub-Module

Participate: General Nursing Discussion: Using Math in a Medical Setting
(initial post is due the Friday before the deadline)

Participate: Do the Math Discussion: Review of Algebra (initial post is due the Friday before the deadline)

Complete: Module 2 Exam in MyLabsPlus

MODULE 3

Reading/Assignments/Exams

Read/Review:
- Chapter 3 in MyLabsPlus
- Chapter Powerpoint slides in MyLabsPlus

Complete: Study Plan for Chapter 3 in MyLabsPlus (including any graded Study Material Quizzes)

Participate: Do the Math Discussion: Chapter 3 (initial post is due the Friday before the deadline)

Read/Review:
- Chapter 4 in MyLabsPlus
- Chapter Powerpoint slides in MyLabsPlus

Complete: Study Plan for Chapter 4 in MyLabsPlus (including any graded Study Material Quizzes)

Participate: Do the Math Discussion: Chapter 4 (initial post is due the Friday before the deadline)

Read/Review:
- Chapter 5 in MyLabsPlus
- Exploration
- Chapter Powerpoint slides in MyLabsPlus

Complete: Study Plan for Chapter 5 in MyLabsPlus (including any graded Study Material Quizzes)

Participate: Do the Math Discussion: Chapter 5 (initial post is due the Friday before the deadline)

Participate: General Nursing Discussion: Mathematical Mistakes Leading to Medical Mistakes (initial post is due the Friday before the deadline)

Complete: Module 3 Exam in MyLabsPlus
MODULE 4

Reading/Assignments/Exams

Read/Review:
• Chapter 6 in MyLabsPlus
• Chapter Powerpoint slides in MyLabsPlus
Complete: Study Plan for Chapter 6 in MyLabsPlus (including any graded Study Material Quizzes)
Participate: Do the Math Discussion: Chapter 6 (initial post is due the Friday before the deadline)

Read/Review:
• Chapter 7 in MyLabsPlus
• Chapter Powerpoint slides in MyLabsPlus
Complete: Study Plan for Chapter 7 in MyLabsPlus (including any graded Study Material Quizzes)
Participate: Do the Math Discussion: Chapter 7 (initial post is due the Friday before the deadline)
Participate: General Nursing Discussion: Dimensional Analysis and the BSA Formulas (initial post is due the Friday before the deadline)

Read/Review:
• Chapter 8 in MyLabsPlus
• Exploration
• Chapter Powerpoint slides in MyLabsPlus
Complete: Study Plan for Chapter 8 in MyLabsPlus (including any graded Study Material Quizzes)
Participate: Do the Math Discussion: Chapter 8 (initial post is due the Friday before the deadline)

Read/Review:
• Chapter 9 in MyLabsPlus
• Exploration
• Chapter Powerpoint slides in MyLabsPlus
Complete: Study Plan for Chapter 9 in MyLabsPlus (including any graded Study Material Quizzes)
Participate: Do the Math Discussion: Chapter 9 (initial post is due the Friday before the deadline)

Complete: Module 4 Exam in MyLabsPlus
## MODULE 5

### Reading/Assignments/Exams

<table>
<thead>
<tr>
<th>Read/Review:</th>
<th>Due Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Chapter 10 in MyLabsPlus</td>
<td></td>
</tr>
<tr>
<td>• Chapter Powerpoint slides in MyLabsPlus</td>
<td></td>
</tr>
<tr>
<td>Complete: Study Plan for Chapter 10 in MyLabsPlus (including any graded</td>
<td></td>
</tr>
<tr>
<td>Study Material Quizzes)</td>
<td></td>
</tr>
<tr>
<td>Participate: Do the Math Discussion: Chapter 10 (initial post is due the</td>
<td></td>
</tr>
<tr>
<td>Friday before the deadline)</td>
<td></td>
</tr>
<tr>
<td>Participate: General Nursing Discussion: Nurse Interview (initial post is</td>
<td></td>
</tr>
<tr>
<td>due the Friday before the deadline)</td>
<td></td>
</tr>
<tr>
<td>Read/Review:</td>
<td></td>
</tr>
<tr>
<td>• Chapter 11 in MyLabsPlus</td>
<td></td>
</tr>
<tr>
<td>• Chapter Powerpoint slides in MyLabsPlus</td>
<td></td>
</tr>
<tr>
<td>Complete: Study Plan for Chapter 11 in MyLabsPlus (including any graded</td>
<td></td>
</tr>
<tr>
<td>Study Material Quizzes)</td>
<td></td>
</tr>
<tr>
<td>Participate: Do the Math Discussion: Chapter 11 (initial post is due the</td>
<td></td>
</tr>
<tr>
<td>Friday before the deadline)</td>
<td></td>
</tr>
<tr>
<td>Read/Review:</td>
<td></td>
</tr>
<tr>
<td>• Chapter 12 in MyLabsPlus</td>
<td></td>
</tr>
<tr>
<td>• Exploration</td>
<td></td>
</tr>
<tr>
<td>• Chapter Powerpoint slides in MyLabsPlus</td>
<td></td>
</tr>
<tr>
<td>Complete: Study Plan for Chapter 12 in MyLabsPlus (including any graded</td>
<td></td>
</tr>
<tr>
<td>Study Material Quizzes)</td>
<td></td>
</tr>
<tr>
<td>Participate: Do the Math Discussion: Chapter 12 (initial post is due the</td>
<td></td>
</tr>
<tr>
<td>Friday before the deadline)</td>
<td></td>
</tr>
<tr>
<td>Complete: Module 5 Exam in MyLabsPlus (by Saturday!)</td>
<td></td>
</tr>
<tr>
<td>Complete: Final Exam in MyLabsPlus (by Saturday!)</td>
<td></td>
</tr>
</tbody>
</table>

Last modified 8/13/2019