

**ESSEX COUNTY COLLEGE**  
**Mathematics and Physics Division**  
**MTH 116 – Medical Mathematics Calculations**  
**Course Outline**

**Course Number & Name:** MTH 116 Medical Mathematics Calculations

**Credit Hours:** 1.0      **Contact Hours:** 1.0      **Lecture:** 1.0      **Lab:** N/A      **Other:** N/A

**Prerequisites:** Grade of “C” or better in MTH 092 or placement

**Co-requisites:** NRS 107

**Concurrent Courses:** None

**Course Outline Revision Date:** Fall 2010

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**Course Description:** This course reviews basic mathematical calculations and conversions and emphasizes how these techniques are used in the administration of medications.

**Course Goals:** Upon successful completion of this course, students should be able to do the following:

1. demonstrate knowledge of the fundamental concepts and theories from arithmetic and algebra; and
2. utilize various problem-solving and critical thinking approaches to solve real-life medical-type problems including administration-of-medication problems.

**Measurable Course Performance Objectives (MPOs):** Upon successful completion of this course, students should specifically be able to do the following:

1. Demonstrate knowledge of the fundamental concepts and theories from arithmetic and algebra:
  - 1.1 *add, subtract, multiply, and divide decimal numbers;*
  - 1.2 *determine the relative value of decimals;*
  - 1.3 *simplify fractions;*
  - 1.4 *multiply and divide fractions;*
  - 1.5 *determine the relative value of fractions;*
  - 1.6 *convert between multiple systems of measurement;*
  - 1.7 *convert percentages to decimals or fractions; and*
  - 1.8 *set up and solve a ratio-proportion*
2. Utilize various problem-solving and critical thinking approaches to solve real-life medical-type problems including administration-of-medication problems:
  - 2.1 *use the ratio-proportion method to solve administration-of-medication problems; and*
  - 2.2 *use problem-solving methods to solve other medical-type (nonmedication) problems*

**Methods of Instruction:** Instruction will consist of a combination of lectures, class discussions, group work, board work, computer lab work, and individual study.

**Outcomes Assessment:** Test and exam questions are blueprinted to course objectives. Data is collected and analyzed to determine the level of student performance on these assessment instruments in regards to meeting course objectives. The results of this data analysis are used to guide necessary pedagogical and/or curricular revisions.

**Course Requirements:** All students are required to:

1. Maintain regular attendance.
2. Complete assigned homework or projects in a timely manner.
3. Take part in class discussions and do problems on the board when required.
4. Take all tests and exams when scheduled. These include a minimum of two class tests as well as a midterm exam and a final exam.

**Methods of Evaluation:** Final course grades will be computed as follows:

<b>Grading Components</b>	<b>% of final course grade</b>
<ul style="list-style-type: none"><li>• <b>Homework and class participation</b> A perusal of homework problems and an analysis of class discussion will indicate the extent to which students master course objectives.</li></ul>	<b>0 – 10%</b>
<ul style="list-style-type: none"><li>• <b>2 or more Tests</b> (dates specified by the instructor) Tests will show evidence of the extent to which students meet course objectives, including, but not limited to, identifying and applying concepts, analyzing and solving problems, estimating and interpreting results, and stating appropriate conclusions using correct terminology.</li></ul>	<b>30 – 40%</b>
<ul style="list-style-type: none"><li>• <b>Midterm Exam</b> The midterm exam will examine the extent to which students have understood and synthesized all course content and achieved all course objectives in the first half of the semester.</li></ul>	<b>25 – 35%</b>
<ul style="list-style-type: none"><li>• <b>Final Exam</b> The final exam will examine the extent to which students have understood and synthesized all course content and achieved all course objectives.</li></ul>	<b>30 – 40%</b>

**NOTE:** The instructor will provide specific weights, which lie in the above-given ranges, for each of the grading components at the beginning of the semester. Also, students must score at least 75% on the final exam in order to pass the course.

**Academic Integrity:** Dishonesty disrupts the search for truth that is inherent in the learning process and so devalues the purpose and the mission of the College. Academic dishonesty includes, but is not limited to, the following:

- plagiarism – the failure to acknowledge another writer’s words or ideas or to give proper credit to sources of information;
- cheating – knowingly obtaining or giving unauthorized information on any test/exam or any other academic assignment;
- interference – any interruption of the academic process that prevents others from the proper engagement in learning or teaching; and
- fraud – any act or instance of willful deceit or trickery.

Violations of academic integrity will be dealt with by imposing appropriate sanctions. Sanctions for acts of academic dishonesty could include the resubmission of an assignment, failure of the test/exam, failure in the course, probation, suspension from the College, and even expulsion from the College.

**Student Code of Conduct:** All students are expected to conduct themselves as responsible and considerate adults who respect the rights of others. Disruptive behavior will not be tolerated. All students are also expected to attend and be on time all class meetings. No cell phones or similar electronic devices are permitted in class. Please refer to the Essex County College student handbook, *Lifeline*, for more specific information about the College’s Code of Conduct and attendance requirements.

**Course Content Outline:** based on the text **Math for Clinical Practice**, 2<sup>nd</sup> edition, by Macklin, Chernecky, and Infortuna; published by Elsevier Mosby, 2005

<b>Week</b>	<b>Chapter/Content</b>
1	1 Decimals: Relative Value, Addition, and Subtraction 2 Decimals: Multiplication and Division 3 Fractions: Reduction and Equations 4 Units of Measure 5 Conversion
2	6 Percentages 7 Ratio-Proportion Method
3	<b>Test 1</b> 8 Calculating Body Weight
4	19 Intake and Output 10 Oral Medications 11 Parenteral Medications
5	<b>Midterm Exam</b>
6	12 Reconstituting Medications 15 Intravenous Flow Rate Calculations
7	<b>Test 2</b> 16 Calculating Intravenous Heparin Dosage
8	17 Insulin 18 Calculating Sliding-Scale Regular Insulin Dosage
9	Review for Final Exam
10	<b>Final Exam</b>