

ITT Technical Institute  
**NU121**  
**Dosage Calculations**  
**Onsite and Online Course**

**SYLLABUS**

---

**Credit hours:** 1

**Contact/Instructional hours:** 10 (10 Theory Hours)

**Prerequisite(s) and/or Corequisite(s):**

Prerequisites: NU110 Clinical Nursing Concepts and Techniques I, GE127 College Mathematics I

**Course Description:**

This course builds on basic math concepts to introduce step-by-step approaches to the calculation and administration of drug dosages. The course incorporates the ratio and proportion, formula, and dimensional analysis methods. Technology is used to present and reinforce application of content.



## COURSE SUMMARY

### COURSE DESCRIPTION

This course builds on basic math concepts to introduce step-by-step approaches to the calculation and administration of drug dosages. The course incorporates the ratio and proportion, formula, and dimensional analysis methods. Technology is used to present and reinforce application of content.

### MAJOR INSTRUCTIONAL AREAS

1. Medication Calculation
2. Safe Medication Administration for Adults and Children
3. Insulin Administration
4. Heparin Administration

### COURSE LEARNING OBJECTIVES

By the end of this course, you should be able to:

1. Explain the importance of critical thinking in dosage calculation related to providing competent nursing care.
2. Describe the legal/ethical issues related to the accurate administration of medications using the “seven rights” (right patient, right medication, right dose, right route, right time, right documentation, and right to refuse medication).
3. Convert measures within and between the metric, apothecary, and household systems of measurement.
4. Interpret medication labels and orders.
5. Calculate the dosages of medications, including insulin and heparin.
6. Determine dosages based on weight and body surface area.
7. Calculate flow rates for intravenous medications and fluids.

**COURSE OUTLINE**

**MODULE 1: INTRODUCTION TO DOSAGE CALCULATIONS**

**COURSE LEARNING OBJECTIVES**

- Explain the importance of critical thinking in dosage calculation related to providing competent nursing care.
- Convert measures within and between the metric, apothecary, and household systems of measurement.

MODULE LEARNING ACTIVITIES (UNGRADED)	OUT-OF-CLASS TIME
<b>Reading:</b> LeFever Kee, J., & Marshall, S. M., Chapter 1 (pp. 19–25) and Chapter 2 (pp. 29–32).	1 hr
<b>Lesson:</b> Study the lesson for this module.	1 hr
<b>Quiz:</b> Prepare for Quiz 1.	1.5 hrs

MODULE ASSESSMENTS (GRADED)	OUT-OF-CLASS TIME
<b>Homework Assignment 1:</b> Submit the exercise titled “Exercise Worksheet 1.”	1 hr

Total Out-of-Class Activities: 4.5 Hours

**MODULE 2: MEDICATION ORDERS AND PREVENTING ERRORS**

**COURSE LEARNING OBJECTIVES COVERED**

- Explain the importance of critical thinking in dosage calculation related to providing competent nursing care.
- Describe the legal/ethical issues related to the accurate administration of medications using the “seven rights” (right patient, right medication, right dose, right route, right time, right documentation, and right to refuse medication).
- Convert measures within and between the metric, apothecary, and household systems of measurement.
- Interpret medication labels and orders.
- Calculate the dosages of medications, including insulin and heparin.

MODULE LEARNING ACTIVITIES (UNGRADED)	OUT-OF-CLASS TIME
<b>Reading:</b> LeFever Kee, J., & Marshall, S. M., <i>Chapter 3 (pp. 38-55) and Chapter 4 (pp. 58-62).</i>	2 hrs
<b>Lesson:</b> Study the lesson for this module.	1 hr
<b>Quiz:</b> Prepare for Quiz 2.	1.5 hrs

MODULE ASSESSMENTS (GRADED)	OUT-OF-CLASS TIME
<b>Homework Assignment 2:</b> Submit the exercise titled “Exercise Worksheet 2.”	1 hr
<b>Quiz:</b> Take Quiz 1.	N/A
<b>Quiz:</b> Take Quiz 2.	N/A

Total Out-of-Class Activities: 5.5 Hours

**MODULE 3: ORAL MEDICATION DOSAGE CALCULATIONS**

**COURSE LEARNING OBJECTIVES COVERED**

- Describe the legal/ethical issues related to the accurate administration of medications using the “seven rights” (right patient, right medication, right dose, right route, right time, right documentation, and right to refuse medication).
- Convert measures within and between the metric, apothecary, and household systems of measurement.
- Interpret medication labels and orders.
- Calculate the dosages of medications, including insulin and heparin.

MODULE LEARNING ACTIVITIES (UNGRADED)	OUT-OF-CLASS TIME
<b>Reading:</b> LeFever Kee, J., & Marshall, S. M., <i>Chapter 6 (pp. 76-84) and Chapter 8 (pp. 109-116 and pp. 132-138).</i>	1.5 hrs
<b>Lesson:</b> Study the lesson for this module.	2 hrs
<b>Quiz:</b> Prepare for Quiz 3.	1.5 hrs
<b>Quiz:</b> Prepare for Quiz 4.	1.5 hrs

MODULE ASSESSMENTS (GRADED)	OUT-OF-CLASS TIME
<b>Homework Assignment 3:</b> Submit the exercise titled “Exercise Worksheet 3.”	1 hr
<b>Quiz:</b> Take Quiz 3.	N/A
<b>Quiz:</b> Take Quiz 4.	N/A

Total Out-of-Class Activities: 7.5 Hours

**MODULE 4: INJECTABLE MEDICATION DOSAGE CALCULATIONS**

**COURSE LEARNING OBJECTIVES COVERED**

- Describe the legal/ethical issues related to the accurate administration of medications using the “seven rights” (right patient, right medication, right dose, right route, right time, right documentation, and right to refuse medication).
- Convert measures within and between the metric, apothecary, and household systems of measurement.
- Interpret medication labels and orders.
- Calculate the dosages of medications, including insulin and heparin.

MODULE LEARNING ACTIVITIES (UNGRADED)	OUT-OF-CLASS TIME
<b>Reading:</b> LeFever Kee, J., & Marshall, S. M., <i>Chapter 9 (pp. 148-157)</i> .	1 hr
<b>Lesson:</b> Study the lesson for this module.	2 hrs
<b>Quiz:</b> Prepare for Quiz 5.	1.5 hrs
<b>Quiz:</b> Prepare for Quiz 6.	1.5 hrs

MODULE ASSESSMENTS (GRADED)	OUT-OF-CLASS TIME
<b>Homework Assignment 4:</b> Submit the exercise titled “Exercise Worksheet 4.”	1 hr
<b>Quiz:</b> Prepare for Quiz 5.	N/A
<b>Quiz:</b> Prepare for Quiz 6.	N/A

Total Out-of-Class Activities: 7 Hours

**MODULE 5: INSULIN, HEPARIN, AND IV MEDS**

**COURSE LEARNING OBJECTIVES COVERED**

- Explain the importance of critical thinking in dosage calculation related to providing competent nursing care.
- Describe the legal/ethical issues related to the accurate administration of medications using the “seven rights” (right patient, right medication, right dose, right route, right time, right documentation, and right to refuse medication).
- Convert measures within and between the metric, apothecary, and household systems of measurement.
- Interpret medication labels and orders.
- Calculate the dosages of medications, including insulin and heparin.
- Calculate flow rates for intravenous medications and fluids.

MODULE LEARNING ACTIVITIES (UNGRADED)	OUT-OF-CLASS TIME
<b>Reading:</b> LeFever Kee, J., & Marshall, S. M., <i>Chapter 9 (pp. 160-166 and pp. 168-178) and Chapter 10 (pp. 209-214 and pp. 217-225).</i>	2 hrs
<b>Lesson:</b> Study the lesson for this module.	2 hrs
<b>Quiz:</b> Prepare for Quiz 7.	1.5 hrs
<b>Quiz:</b> Prepare for Quiz 8.	1.5 hrs
<b>Final Exam:</b> Prepare for the final exam.	5 hrs

MODULE ASSESSMENTS (GRADED)	OUT-OF-CLASS TIME
<b>Homework Assignment 5:</b> Submit the exercise titled “Exercise Worksheet 5.”	1 hr
<b>Quiz:</b> Take Quiz 7.	N/A
<b>Quiz:</b> Take Quiz 8.	N/A

Total Out-of-Class Activities: 13 Hours

**MODULE 6: BODY SURFACE AREA AND WEIGHT**

**COURSE LEARNING OBJECTIVES COVERED**

- Explain the importance of critical thinking in dosage calculation related to providing competent nursing care.
- Describe the legal/ethical issues related to the accurate administration of medications using the “seven rights” (right patient, right medication, right dose, right route, right time, right documentation, and right to refuse medication).
- Convert measures within and between the metric, apothecary, and household systems of measurement.
- Interpret medication labels and orders.
- Calculate the dosages of medications, including insulin and heparin.
- Determine dosages based on weight and body surface area.
- Calculate flow rates for intravenous medications and fluids.

MODULE LEARNING ACTIVITIES (UNGRADED)	OUT-OF-CLASS TIME
<b>Reading:</b> LeFever Kee, J., & Marshall, S. M., <i>Chapter 7 (pp. 94-99) and Chapter 11 (pp. 241-249 and pp. 259-260).</i>	1 hr
<b>Lesson:</b> Study the lesson for this module.	2 hrs
<b>Quiz:</b> Prepare for Quiz 9.	1.5 hrs

MODULE ASSESSMENTS (GRADED)	OUT-OF-CLASS TIME
<b>Homework Assignment 6:</b> Submit the exercise titled “Exercise Worksheet 6.”	1 hr
<b>Quiz:</b> Take Quiz 9.	N/A
<b>Final Exam:</b> Take the final exam.	N/A

Total Out-of-Class Activities: 5.5 Hours

## EVALUATION AND GRADING

### EVALUATION CRITERIA

The graded assignments will be evaluated using the following weighted categories:

Grading Categories	Grading Weight
Homework Assignment	30%
Quiz	45%
Final Exam	25%
<b>Total</b>	<b>100%</b>

Missed quizzes may not be made up in this course. The highest six quiz grades will be the scores recorded for the student.

### GRADE CONVERSION

The final grades will be calculated from the percentages earned in the course, as follows:

GRADE	PERCENTAGE
A (4.0)	90–100%
B+ (3.5)	85–89%
B (3.0)	80–84%
C+ (2.5)	75–79%
C (2.0)	70–74%
D+ (1.5)	65–69%
D (1.0)	60–64%
F (0.0)	<60%

## LEARNING MATERIALS AND REFERENCES

### REQUIRED COURSE MATERIAL

- LeFever Kee, J., & Marshall, S. M. (2012). *Clinical calculations: With applications to general and specialty areas (7th ed.)*. St. Louis, MO: Saunders.

### INSTRUCTIONAL METHODS AND TEACHING STRATEGIES

The curriculum employs a variety of instructional methods that support the course objectives while fostering higher cognitive skills. These methods are designed to encourage and engage you in the learning process in order to maximize learning opportunities. The instructional methods include but are not limited to lectures, collaborative learning options, and hands-on activities.

To implement the above-mentioned instructional methods, this course uses several teaching strategies, such as lectures, collaborative learning options, and hands-on activities. Your progress will be regularly assessed through a variety of assessment tools including homework assignment, quiz, and final exam.

### OUT-OF-CLASS WORK

For purposes of defining an academic credit hour for Title IV funding purposes, ITT Technical Institute considers a quarter credit hour to be the equivalent of: (a) at least 10 clock hours of classroom activities and at least 20 clock hours of outside preparation; (b) at least 20 clock hours of laboratory activities; or (c) at least 30 clock hours of externship, practicum or clinical activities. ITT Technical Institute utilizes a “time-based option” for establishing out-of-class activities which would equate to two hours of out-of-class activities for every one hour of classroom time. The procedure for determining credit hours for Title IV funding purposes is to divide the total number of classroom, laboratory, externship, practicum and clinical hours by the conversion ratios specified above. A clock hour is 50 minutes.

A credit hour is an artificial measurement of the amount of learning that can occur in a program course based on a specified amount of time spent on class activities and student preparation during the program course. In conformity with commonly accepted practice in higher education, ITT Technical Institute has institutionally established and determined that credit hours awarded for coursework in this program course (including out-of-class assignments and learning activities described in the “Course Outline” section of this syllabus) are in accordance with the time-based option for awarding academic credit described in the immediately preceding paragraph.

## ACADEMIC INTEGRITY

All students must comply with the policies that regulate all forms of academic dishonesty or academic misconduct. For more information on the academic integrity policies, refer to the Student Handbook and the Course Catalog.

*(End of Syllabus)*