

**Ralph R. Willis Career and Technical Center  
School of Practical Nursing  
Pharmacology**

	Theory	Testing	Lab
<b>Chapter 1 Drug Definitions and Standards, and Information Resources</b>	1	.5	
<b>Chapter 2 Basic Principles of Drug Action and Drug Interactions</b>	1	.5	
<b>Chapter 3 Drug Action Across the Life Span</b>	1	.5	
<b>Chapter 4 The Nursing Process and Pharmacology</b>	1	.5	
<b>Chapter 5 Patient Education to Promote Health</b>	1	.5	
<b>Chapter 6 Principles of Medication Administration And Medication Safety</b>	1	.5	
<b>Chapter 7 Percutaneous Administration</b>	2	.5	2
<b>Chapter 8 Enteral Administration</b>	2	.5	2
<b>Chapter 9 Parenteral Administration: Safe Preparation Of Parenteral Medications</b>	2	.5	2
<b>Chapter 10 Parenteral Administration: Intradermal, Subcutaneous, and Intramuscular Route</b>	2	.5	2
<b>Chapter 11 Parenteral Administration: Intravenous Route</b>	2	.5	2
<b>Drug Dosage Calculations</b>	2	1	
<b>Final</b>		<b>1</b>	
<b>Total</b>	<b>18</b>	<b>7.5</b>	<b>10 35.5</b>

Revised: 03/16/2020

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**Course Hours: 80 HRS**

**Theory: 35.5 HRS**

**Clinical Hours: 44.5 HRS**

**WVEIS:**

**TEXTBOOKS:**

1. Willihnganz, Michelle J. / Gurevitz, Samuel L. / Clayton, Bruce D.; CLAYTON'S BASIC PHARMACOLOGY for NURSES, St. Luis, Elsevier;18<sup>th</sup> edition; 2020.

**Course Description**

This course is an introduction to the science of pharmacology with emphasis on the actions, interactions, adverse effects, and nursing implications of each drug classification. Topics include the skills, roles, and responsibilities of the nurse in safe administration of medications within an ethical/legal framework. Dosage calculations and medication administration skills are practiced in a laboratory setting. Pharmacology is integrated throughout the medical- surgical, geriatric and pediatric and obstetric courses interrelating the body system with the disease process as well as the drug classification, patient education, wellness, maintenance, alternative therapies and cultural considerations.

**Course Objectives**

**At the end of this course the student will:**

1. Describe how drugs are classified.
2. Explain the legal implications for administration of drugs by nurses.
3. Trace the general actions of drugs in the body.
4. Discuss measures used to prevent medication errors.
5. Discuss routes of medication administration.
6. Discuss special consideration of medication administration across the life span.
7. Calculate medication dosage.
8. Prepare and administer medication in the following form: Oral, Topical, Inhalant, Intradermal, Subcutaneous, Z-Track and Intramuscular.

**Clinical Practicum:**

Completed in Acute and Long-Term Care.

**Methods of Teaching:**

1. Lecture, discussion, role playing emphasizing critical thinking
2. Videos
3. PowerPoint
4. Case Studies
5. Demonstration
6. Individual and Group Conference
7. Written Exams
9. Clinical Lab Practice/ Clinical Setting
10. Evaluations

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**Student Responsibilities:**

1. Read assigned chapter.
2. Refer to and follow student monthly calendar for exam dates.
3. Attend lectures and demonstrations.
3. Complete activities as assigned.
5. Participate in class/lab activities.
6. Discuss critical thinking activities associated with the lesson.
7. Refer and follow the policies as outlined and discussed in the Student Handbook.
8. Pass exams with a grade of 80% or higher.

**Methods of Evaluation**

1. The following letter grade system is utilized for theory:  
A 93 - 100  
B 86 - 92  
C 80 - 85  
F 79 - 0
2. The following grading calculation is utilized for theory:  
Exams 60%                      Quizzes 10%                      Final 30%
3. Evaluation Tools:
  - a. Oral Presentations
  - b. Written Exams
  - c. Laboratory Skills
  - d. Homework Assignments
  - e. Computer Exams
  - f. Clinical Skills
4. Make-up Exam:  
A student who misses an exam must be prepared to take the exam immediately upon return or as designated by the instructor. Students will automatically have 5% deducted.
5. Quizzes:  
Students who are absent during a quiz will receive a Zero. Quizzes are NOT made up.
6. See student monthly calendar for schedule of exam dates.
7. See Student Handbook for clinical grading guidelines.

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**Chapter 1: Drug Definitions, Standards, and Information Sources**

**Instructor Provided**

**Lesson Content: 1HR**

**Testing: .5 HRS**

**Lesson Content:**

- I. Key Terms
- II. Drug Names, Standards, Legislation, and Development in the United States
  - A. Drug Names
  - B. Drug Classifications
  - C. Sources of Drug Standards and Drug Information
  - D. United States Drug Legislation
  - E. New Drug Development
- III. Drug Names, Standards, and Legislation in Canada
  - A. Canadian Drug Names
  - B. Sources of Canadian Drug Standards
  - C. Canadian Drug Legislation

**Lesson Objectives:**

Upon completion of this chapter the student will:

1. Define key terms.
2. Differentiate between the chemical, generic, and brand names of drugs.
3. Identify the various methods used to classify drugs.
4. Identify sources of drug information available for healthcare providers.
5. Cite sources of credible drug information on the Internet.
6. Discuss the difference between prescription and nonprescription drugs.
7. Describe the process of developing and bringing new drugs to market.
8. Differentiate between the Canadian chemical names and the proper name of a drug.

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**Chapter 2: Basic Principles of Drug Action and Drug Interactions**

**Instructor Provided**

**Lesson Content: 1 HR**

**Testing: .5HRS**

**Lesson Content:**

- I. Key Terms
- II. Basic Principles Related to Drug Therapy
- III. Drug Actions
- IV. Drug Interactions

**Lesson Objectives:**

Upon completion of this chapter the student will:

1. Define key terms.
2. Identify common drug administration routes.
3. Identify the meaning and significance of the term half-life when used in relation to drug therapy.
4. Describe the process of how a drug is metabolized in the body.
5. Compare and contrast the following terms that are used in relationship to medications: desired action, common adverse effects, allergic reactions, and idiosyncratic reactions.
6. Identify what is meant by a drug interaction.
7. Differentiate among the terms additive effect, synergistic effect, antagonistic effect, displacement, interference, and incompatibility.
8. Identify one way in which alternatives in metabolism create drug interactions.

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**Chapter 3: Drug Action Across the Life Span**

**Instructor Provided**

**Lesson Content: 1HR**

**Testing: .5 HRS**

**Lesson Content:**

- I. Key Terms
- II. Factors that Affect Drug Therapy
- III. Factors that Influence Drug Actions
- IV. Therapeutic Drug Monitoring
- V. Nursing Implications When Monitoring Drug Therapy
- VI. Genetics and Drug Metabolism

**Lesson Objective:**

Upon completion of this chapter the student will:

1. Define key terms.
2. Explain the impact of the placebo effect and nocebo effect.
3. Identify the importance of drug dependence and drug accumulation.
4. Discuss the effects of age of drug absorption, distribution, metabolism, and excretion.
5. Explain the gender-specific considerations of drug absorption, distribution, metabolism, and excretion.
6. Describe where a nurse will find new information about the use of drugs during pregnancy and lactation.
7. Discuss the impact of pregnancy and breastfeeding on drug absorption, distribution, metabolism, and excretion.
8. Discuss the role of genetics and its influence on drug action.

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**Chapter 4:                   The Nursing Process and Pharmacology**

**Instructor Provided**

**Lesson Content: 1 HR**

**Testing: .5 HRS**

**Lesson Content:**

- I.       Key Terms
- II.     The Nursing Process
- III.    Relating the Nursing Process to Pharmacology

**Lesson Objectives:**

Upon completion of this chapter the student will:

1. Define key terms.
2. Discuss the components and purpose of the nursing process.
3. Explain what the nurse does to collect patient information during an assessment.
4. Discuss how nursing diagnosis statements are written.
5. Differentiate between a nursing diagnosis and a medical diagnosis.
6. Discuss how evidence-based practice is used in planning nursing care.
7. Differentiate between nursing interventions and expected outcome statements.
8. Explain how Maslow's hierarchy of needs is used to prioritize patient needs.
9. Compare and contrast the differences between dependent, interdependent, and independent nursing actions.
10. Discuss how the nursing process applies to pharmacology.

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**Chapter 5: Patient Education to Promote Health**

**Instructor Provided**

**Lesson Content: 1 HR**

**Testing: .5 HRS**

**Lesson Content:**

- I. Key Terms
- II. Three Domains of Learning
- III. Principles of Teaching and Learning
- IV. Strategies for Healthcare Teaching

**Lesson Objectives:**

Upon completion of this chapter the student will:

1. Define key terms.
2. Differentiate among the cognitive, affective, and psychomotor learning domains.
3. Identify the main principles of learning that are applied when teaching a patient, family, or group.
4. Describe the essential elements of patient education in relation to prescribed medications.
5. Describe the nurse's role in fostering patient responsibility for maintaining well-being and for adhering to the therapeutic regimen.
6. Identify the types of information that should be discussed with the patient or significant others.
7. Discuss specific techniques used in the practice setting to facilitate patient education.



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**Chapter 6: Principles of Medication Administration and Medication Safety**  
**Instructor Provided**

**Lesson Content: 1 HR**

**Testing: .5 HRS**

**Lesson Content:**

- I. Legal and Ethical Considerations
- II. Patient Charts
- III. Drug Distribution Systems
- IV. Disposal of Unused Medicines
- V. Medication Orders
- VI. Medication Safety
- VII. Seven Rights of Drug Administration

**Lesson Objectives:**

Upon completion of this chapter the student will:

1. Define key terms.
2. Identify the legal and ethical considerations for medication administration.
3. Compare and contrast the various systems used to dispense medications.
4. Identify what a narcotic control system entails.
5. Define the four categories of medication orders.
6. Identify common types of medication errors and actions that can be taken to prevent them.
7. Identify precautions used to ensure the right drug is prepared and given to the right patient.
8. List the seven rights of drug administration.
9. Identify the appropriate nursing documentation of medications, including the effectiveness of each medication.

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**Chapter 7: Percutaneous Administration**

**Instructor Provided**

**Lesson Content: 2 HRS**

**Clinical Practice: 2 HRS**

**Testing: .5 HRS**

**Lesson Content:**

- I. Key Term
- II. Administration of Topical Medications to the Skin
  - A. Administration of Creams, Lotions and Ointments
  - B. Patch Testing for Allergens
  - C. Administration of Nitroglycerin Ointment
  - D. Administration of Transdermal Drug Delivery Systems
  - E. Administration of Topical Powders
- III. Administration of Medications to Mucous Membranes
  - A. Administration of Sublingual and Buccal Tablets
  - B. Administration of Eye drops and Ointments
  - C. Administration of Eardrops
  - D. Administration of Nose Drops
  - E. Administration of Nasal Sprays
  - F. Administration of Medications by Inhalation
  - G. Administration of Medications by Oral Inhalation
  - H. Administration of Vaginal Medications
  - I. Administration of a Vaginal Douche

**Lesson Objectives:**

Upon completion of this chapter the student will:

1. Define key terms.
2. Identify the equipment needed and the techniques used to apply each of the topical forms of medications to the skin.
3. Describe the purpose of and the procedure used for performing patch testing.
4. Identify the equipment needed, the sites and techniques used, and the patient education required when nitroglycerin ointment is prescribed.
5. Identify the equipment needed, the sites and techniques used, and the patient education required when transdermal patch medication systems are prescribed.
6. Describe the dose forms, the sites and equipment used, and the techniques for the administration of medications to the mucous membranes.
7. Compare the techniques that are used to administer eardrops to patients who are less than 3 years old with those that are used for patients who are 3 years and older.
8. Describe the purpose, the precautions necessary, and the patient education required for those patients who require medications via inhalation.
9. Identify the equipment needed, the site, and the specific techniques required to administer vaginal medications or douches.

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**Clinical Practice**

1. Give oral, sublingual, buccal and topical medications using the Seven Rights.
2. Prepare and apply topical medications such as eye ointments, eardrops, nasal medications, transdermal patches, and topical ointments, powders, creams and lotions.
3. Teach a patient the purpose, procedure and follow-up care of patch testing.
4. Teach a patient to use a metered-dose inhaler.
5. Instill a vaginal and a rectal suppository safely and effectively.
6. Write a care plan for a patient who is receiving medication to include patient specific data, an identified nursing diagnosis, and interventions that you used.
7. Document medication administration and your patient's response to the therapy.

**Skills**

- 1. Administration of topical creams, lotions, and ointments.**
- 2. Patch testing for Allergens.**
- 3. Administration of Nitroglycerin Ointment.**
- 4. Administration of Transdermal drug delivery system.**
- 5. Administration of Topical Powders.**
- 6. Administration of Sublingual and Buccal Tablets.**
- 7. Administration of Eyedrops and Ointments,**
- 8. Administration of Eardrops.**
- 9. Administration of Nose Drops.**
- 10. Administration of Nasal Spray.**
- 11. Administration of Medications by Inhalation.**
- 12. Administration of Medications by Oral Inhalation.**
- 13. Administration of Vaginal Medications.**
- 14. Administration of a Vaginal Douche.**

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**Chapter 8: Enteral Administration**

**Instructor Provided**

**Lesson Content: 2 HRS**

**Clinical Practice: 2 HRS**

**Testing: .5 HRS**

**Lesson Content:**

- I Key Terms
- II Administration of Oral Medications
- III Administration of Solid-Form Oral Medications
  - A. Unit-Dose System
  - B. Computer-Controlled Dispensing System
  - C. General Principles of Solid-Form medication Administration
- IV Administration of Liquid-Form Oral Medications
  - A. Unit-Dose System
  - B. General Principles of Liquid-Form Oral Medication Administration
- V Administration of Medications by Nasogastric, Nasoduodenal, Nasojejun Tube
- VI Administration of Enteral Feedings via Gastrostomy or Jejunostomy Tube
- VII Administration of Rectal Suppositories
- VIII Administration of Disposable Enema

**Lesson Objectives:**

Upon completion of this chapter the student will:

1. Define Key Terms.
2. Describe general principles of administering solid forms of oral medications.
3. Compare the different techniques that are used with a unit-dose distribution system and a computer-controlled dispensing system.
4. Identify general principles used for liquid-form oral medication administration.
5. Cite the equipment needed, techniques used, and precautions necessary when administering medications via a nasogastric tube.
6. Cite the equipment needed and the technique required when administering rectal suppositories and disposable enemas.

**Clinical Practice:**

1. Identify the different solid-forms of medications: capsules, lozenges, pills, tablets, elixirs, emulsions, suspensions, and syrups.
2. Determine the proper dispensing equipment based on form of medication: soufflé cup, medicine cup, medicine dropper, teaspoon, oral syringe, and/or nipple.
3. Perform premedication assessment prior to dispensing medications.
4. Checking for placement prior to administering medications, feedings, or flushes to Nasogastric, Nasoduodenal, Nasojejun, Gastrostomy, or Jejunostomy Tubes.
5. Proper instillation of rectal suppositories and disposable enemas.

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**Skills:**

- 1. Administration of Oral Medications.**
- 2. Administration of Solid-Form Oral Medications.**
- 3. Administration of Liquid-Form Oral Medications.**
- 4. Administration of Medications by Nasogastric, Nasodduodenal, Nasojejunal Tube.**
- 5. Administration of Enteral Feedings via Gastrostomy or Jejunostomy Tube.**
- 6. Administration of Rectal Suppositories.**
- 7. Administration of Disposable Enema.**

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**Chapter 9: Parenteral Administration: Safe Preparation of Parenteral Medications**

**Instructor Provided**

**Lesson Content: 2 HRS**

**Testing: .5 HRS**

**Clinical Practice: 2 HRS**

**Lesson Content:**

- I Key Terms
- II Safe Preparation, Administration, and Disposal of Parenteral Medications and Supplies
- III Equipment used for Parenteral Administration
- IV Safety Systems for Parenteral Preparation Administration, and Disposal
- V Parenteral Dose Forms
- VI Preparation of Parenteral Medication

**Lesson Objectives:**

Upon completion of this chapter the student will:

1. Define Key Terms.
2. Identify the parts of a syringe and needle, as well as examples of the safety-type syringes and needles.
3. Describe how to select the correct needle gauge and length and how the needle gauge is determined.
4. Compare and contrast the volumes of medications that can be measured in a tuberculin syringe and those of larger-volume syringes.
5. Compare and contrast the advantages and disadvantages of using prefilled syringes.
6. Differentiate among ampules, vials, and Mix-O-Vials.
7. Describe the technique used to prepare two different drugs in one syringe (e.g., insulin).

**Clinical Practice:**

1. Follow Standard Precautions when administering injections and disposing of used equipment.
2. Aseptically and accurately withdraw and measure the ordered dose of a medication from A vial or ampule.
3. Choose the appropriate syringe and needle for the type of injection ordered.
4. Demonstrate reconstitution of a drug from a powder.
5. Demonstrate the correct method for drawing up two types of drugs, including insulin, in one syringe.
6. Use the five rights of medication administration, also checking for patient drug allergies.
7. Identify and properly dispose of equipment.

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**Skills:**

1. Preparing a Syringe for Use
2. Withdrawing Medication from an Ampule
3. Withdrawing Medication from a Vial
4. Combining Insulins
5. Preparing a Mix-O-Vial
6. Disposing of Equipment and Supplies

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**Chapter 10: Parenteral Administration: Intradermal, Subcutaneous, and Intramuscular Routes**

**Instructor Provided**

**Lesson Content: 2 HRS**

**Testing: .5 HRS**

**Clinical Practice: 2 HRS**

**Lesson Content:**

- I Key Terms
- II Administration of Medication by the Intradermal Route
- III Administration of Medication by the Subcutaneous Route
- IV Administration of Medication by the Intramuscular Route

**Lesson Objectives:**

Upon completion of this chapter the student will:

1. Define key terms.
2. Describe the technique that is used to administer a medication via the intradermal route.
3. List the equipment needed and describe the technique that is used to administer a medication via the subcutaneous route.
4. Describe the technique used to administer medications intramuscularly.
5. Describe the landmarks that are used to identify the vastus lateralis muscle, the ventrogluteal area, and the deltoid muscle sites before medication is administered.
6. Identify suitable sites for the intramuscular administration of medication in an infant, a child, an adult, and an older adult.

**Clinical Practice:**

1. Locate the appropriate site on a patient to give an intradermal, subcutaneous, or intramuscular injection by identifying correct anatomic landmarks.
2. Correctly prepare, administer, and interpret the results of an intradermal injection, using the five rights and aseptic technique.
3. Correctly prepare and administer a subcutaneous injection with 100% accuracy.
4. Correctly prepare and administer an intramuscular injection with 100 % accuracy.
5. Correctly document injections administered after administration.

**Skills:**

1. Administration of Intradermal Injection
2. Administration of Subcutaneous Injection
3. Administration of Intramuscular Injection
4. Administration of Z-Track Injection



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**Chapter 11: Parenteral Administration: Intravenous Route**

**Instructor Provided**

**Lesson Content: 2 HRS**

**Testing: .5 HRS**

**Clinical Practice: 2 HRS**

**Lesson Content:**

- I Key Terms
- II Equipment Used for Intravenous Therapy
- III Intravenous Dose Forms
- IV Administration of Medications by the Intravenous Route
  - A. Preparing an Intravenous Solution for Infusion
  - B. Intravenous Fluid Monitoring
- V Basic Guidelines for the Intravenous Administration of Medications
  - A. Venipuncture
  - B. Administration of Medication by a Saline Lock or a Medlock
  - C. Administration of Medications Into an Established Intravenous Line
  - D. Administration of Medication Through an Implanted Venous Access Device
  - E. Adding a Medication to an Intravenous Bag, Bottle, or Volume-Control Device
  - F. Adding a Medication with a Piggyback Set
  - G. Changing to the Next Container of Intravenous Solution
  - H. Care of Peripheral Sites, Central Venous Catheters, and Implanted Ports
  - I. Peripheral Site Dressing Changes
  - J. Flushing of Central Venous Catheters
  - K. Dressing Changes for Central Lines
  - L. Care of Venous Ports
  - M. Discontinuing an Intravenous Infusion
- VI Monitoring Intravenous Therapy

**Lesson Objectives:**

Upon completion of this chapter the students will:

1. Define key terms.

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**Drug Dosage Calculations**

**Review: 2 HRS**

**Testing: 1 HR**

**Lesson Content:**

I. Methods of Calculation

- A. Linear Ratio and Proportion
- B. Fractional Ratio and Proportion
- C. Dimensional Analysis
- D. Formula

II. Reading Medication Labels

- A. Trade Name
- B. Dosage Strength
- C. Route of Administration
- D. Instructions for Mixing/Reconstitution
- E. Generic Name
- F. Form of the Drug
- G. Expiration Date
- H. Recommended Dose

III. IV Calculations

**Lesson Objectives:**

Upon completion of instruction, the student will:

1. Learn the method of choice: study the set-up.
2. Read the essential information found on medication label.
3. Determine a safe dosage
4. Pediatric Dosages based upon weight
5. Calculate mL/hr
6. Calculate Flow Rate gtts/min
7. Calculate Infusion Time
8. Drug Titration

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**Final**

**2 hr.**

Students will take and pass the final exam with an 80% or better for overall unit.