

**Virginia Western Community College**  
**SUR 250**  
**Surgical Pharmacology**

**Prerequisites**

BIO 141, SDV 101, HLT 141, SUR 100, SUR 135, SUR 140, SUR 145, BIO 142

**Co-Requisites**

ENG 111, HLT 105, SUR 150, SUR 240, SUR 245

**Course Description**

Introduces pharmacology as it relates to surgical intervention in the operating room. Includes medication calculations, measurements, administration, terminology and handling and a review of certain drug classifications as they relate to surgical patients. (Note: Previously listed as HLT 250, General Pharmacology).

**Semester Credits: 2**

**Lecture Hours: 2**

**Lab/Clinical/Internship Hours: 0**

**Required Materials****Textbook:**

<b>Title</b>	<b>Author</b>	<b>Edition</b>
Surgical Technology for the Surgical Technologist ISBN-10: 9781305956414	AST/Cengage	5 <sup>th</sup>
Pharmacology for the Surgical Technologist ISBN: 978-0-323-66121-8	Tiffany Howe & Angie Burton	5 <sup>th</sup>

**Other Required Materials:**

Pharmacology drug card folder – provided by instructor on 1<sup>st</sup> day of class

**Course Outcomes**

<b>Course Learning Objectives/Learning Outcomes – Upon completion of the course, students will be able to:</b>
Describe the principles of pharmacokinetics, pharmacodynamics, and different drug categories and give examples of drugs in each category.
Apply the correct protocol for receiving drugs on the sterile field, labeling, discuss ways to prevent drug errors, how to correctly identify and interpret the components of a drug label by adhering to the use of the seven rights of the medication process.
List and describe the different drug delivery devices, role of the surgical technologist in handling drugs.
Explain important anesthesia concepts, anesthesia evaluation, and anesthesia selection process.
Explain the preparation of the patient.

Define general anesthesia, describe induction, maintenance and emergence.
Discuss the difference between dissociative anesthesia and conscious sedation, regional anesthesia, and concepts of airway management.
Define the role of the surgical technologist during the use of anesthesia.

### **Topical Description**

1. Introduction to Pharmacology
  - a. Basic Pharmacology
    - i. Drug sources, drug classifications, medication orders, drug distribution systems, drug forms or preparations, drug administration routes, pharmacokinetics, plasma protein bonding, pharmacodynamics
  - b. Medication Development, Regulation & Resources
    - i. Medication regulation, drug development, medication references
  - c. Pharmacology Mathematics
    - i. Military time, fractions, decimals, percentages, ratio and proportion, temperature conversions, measurement systems
  - d. Medication Administration
    - i. Surgical Technologist's roles in medication administration, five "rights" of medication administration, medication identification, delivery to the sterile field, medication labeling on the sterile back table, handling medications, supplies, sharps safety
2. Applied Surgical Pharmacology
  - a. Antibiotics
    - i. Microbiology review, antimicrobial action, antibiotic agents, antibiotic therapy, antibiotic resistance, peak and trough, sepsis, preoperative antibiotic prophylaxis, intraoperative antibiotic wound irrigation, antivirals, and antifungals
  - b. Diagnostic Agents
    - i. Contrast media, dyes, staining agents, radiopaque contrast media, risk factors for contrast media, adverse reactions, medications, new diagnostic imaging procedures
  - c. Diuretics
    - i. Renal process of excretion, pre-operative and intraoperative implications of diuretic agents, potassium, categories of diuretic agents
  - d. Hormones
    - i. Endocrine system review, endocrine glands, classification of hormones, treatment options, thyroid gland, parathyroid gland, blood serum calcium levels, hyperparathyroidism, hypoparathyroidism
  - e. Medications that Affect Coagulation
    - i. Physiology of clot formation, coagulants, absorbable gelatin, absorbable collagen sponge, microfibrillar collagen hemostat, oxidized cellulose, thrombin, miscellaneous agents used as hemostatic, calcium salts,

vitamin K, blood coagulation factors, anticoagulants, low molecular heparins, factor Xa inhibitor, short term versus long term therapy.

- f. Ophthalmic Agents
    - i. Anatomy review, categories of ophthalmic agents, anesthetics, antiglaucoma agents, cataract extraction, preoperative medications, topical method of local anesthesia, intraoperative medications, postoperative medications
  - g. Fluids and Irrigation Solutions
    - i. Fluid and electrolyte management, blood replacement, irrigation solutions, evaluation for blood replacement osmolality of fluids, intravenous sites and complications, continuous and intermittent irrigation
  - h. Antineoplastic Chemotherapy Agents
    - i. Chemotherapy agents, targeted therapy, biologic response modifiers, gene therapy, search for a cure
3. Anesthesia
- a. Preoperative Medications
    - i. Preoperative evaluation, preoperative medications, medications from the medical setting to the surgical setting, bowel preparations, anticonvulsants, hypertension medicines
  - b. Patient Monitoring and Local and Regional Anesthesia
    - i. Patient monitoring, sedation and monitored anesthesia care, classification of local anesthetics, adverse effects of local anesthetics, concentration or dosage, epinephrine additive to local anesthetics, postoperative pain management with local and regional anesthetics.
  - c. General Anesthesia
    - i. Components of general anesthesia, phases of general anesthesia, agents used for general anesthesia, etc.
  - d. Emergency situations
    - i. Respiratory emergencies, allergic reactions, transfusion (hemolytic) reactions, cardiac arrest, malignant hyperthermia