SGT 123

PHARMACOLOGY FOR SURGICAL TECHNOLOGY

PRESENTED AND APPROVED: AUGUST 9, 2012

EFFECTIVE: FALL 2012-13
**Prefix & Number**  SGT 123  

**Course Title:** Pharmacology for Surgical Technology

**Purpose of this submission:** To coordinate Course pack with Program modification  

- [ ] New  
- [x] Change/Updated  
- [ ] Retire

**If this is a change, what is being changed?**  
(Check all that apply)  

- [ ] Update Prefix  
- [ ] Course Description  
- [ ] Title  
- [ ] Course Number  
- [ ] Format Change  
- [x] Credits  
- [ ] Prerequisite  
- [ ] Competencies  
- [ ] Textbook/Reviewed Competencies-no changes needed

**Does this course require additional fees?**  
- [ ] No  
- [x] Yes  
If so, please explain. Program fees

**Is there a similar course in the course bank?**  
- [ ] No  
- [x] Yes (Please identify) SGT111

**Articulation:**  
Is this course or an equivalent offered at other two and four-year universities in Arizona?  
- [x] No  
- [ ] Yes (Identify the college, subject, prefix, number and title:)

**Is this course identified as a Writing Across the Curriculum course?**  
- [ ] No  
- [x] Yes

### Course Textbook, Materials and Equipment

<table>
<thead>
<tr>
<th>Textbook(s)</th>
<th>Title</th>
<th>Author(s)</th>
<th>Publisher</th>
<th>ISBN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Surgical Technology for the Surgical Technologist: A Positive Care Approach</td>
<td>Association of Surgical Technologists</td>
<td>Delmar, 2004</td>
<td>1-4018-3848-0</td>
</tr>
<tr>
<td></td>
<td>Surgical Technology Principles and Practice, 4th Ed.</td>
<td>Fuller, Joanna R.</td>
<td>Elsevier Saunders, 2005</td>
<td>0-8036-0654-0</td>
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<tr>
<td></td>
<td>Pharmacology for the Surgical Technologist, 2nd Ed.</td>
<td>Snyder, Katherine and Keegan, Chris</td>
<td>Elsevier Saunders, 2006</td>
<td>1-4160-2457-3</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Software/Equipment</th>
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### Course Assessments

<table>
<thead>
<tr>
<th>Description of Possible Course Assessments (Essays, multiple choice, etc.)</th>
<th>Multiple choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams standardized for this course?</td>
<td>Are exams required by the department?</td>
</tr>
</tbody>
</table>
INSTRUCTION
Course Package

- Midterm
- Final
- Other (Please specify):

Where can faculty members locate or access the required standardized exams for this course? (Contact Person and Location)
Example: NCK – Academic Chair Office

Student Outcomes: Identify the general education goals for student learning that is a component of this course.

<table>
<thead>
<tr>
<th>Check all that apply:</th>
<th>Method of Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Communicate effectively.</td>
<td>Function as a student surgical technologist in the hospital operating room</td>
</tr>
<tr>
<td>a. Read and comprehend at a college level.</td>
<td></td>
</tr>
<tr>
<td>b. Write effectively in a college setting.</td>
<td></td>
</tr>
<tr>
<td>2. Demonstrate effective quantitative reasoning and problem solving skills.</td>
<td>Surgical preceptor and clinical instructor evaluations</td>
</tr>
<tr>
<td>3. Demonstrate effective qualitative reasoning skills.</td>
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</tr>
<tr>
<td>4. Apply effective methods of inquiry.</td>
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<tr>
<td>a. Generate research paper by gathering information from varied sources, analyzing data and organizing information into a coherent structure.</td>
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</tr>
<tr>
<td>b. Employ the scientific method.</td>
<td></td>
</tr>
<tr>
<td>5. Demonstrate sensitivity to diversity</td>
<td></td>
</tr>
<tr>
<td>a. Experience the creative products of humanity.</td>
<td></td>
</tr>
<tr>
<td>b. Describe alternate historical, cultural, global perspectives.</td>
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</tbody>
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Office of Instruction Use only:

CIP Code:
ONET Code:
Minimum Qualifications:
COURSE INFORMATION

Initiator: Dr. Robert J. Goodrich
Date of proposal to Curriculum Sub-Committee: August 9, 2012
Effective Semester/Year: Spring 2012
Prefix & Number: SGT 123

Full Title: Pharmacology for Surgical Technology
Short Title: Pharm Tech for SGT

Catalog Course Description: This course is designed for students desiring to work in the operating room. It will acquaint the student with principles of drug use in the surgical patient, and procedures for care and handling of drugs and solutions.

SUN Course Number:
Credit Hours: 3
Lecture Hours: 3
Lab Hours: 0
Prerequisite(s) SGT 121, SGT 122
Co-requisite(s) SGT 221, SGT 222 and SGT 222L

Intended Course Goals

By the end of the semester, students will be able to:
1. Calculate equivalent conversions from one system to another.
2. Define general terminology associated with drugs.
3. Classify various drugs according to type.
4. Identify compressed gases by standard tank colors.
6. Be able to recognize a drug by its generic name, trade name, and chemical names.
7. Identify application, action, effect; effect associated with common drug classes and their representative prototypes.
8. Describe differences between side effects, synergistic reactions and idiosyncratic reactions.
9. Explain the principles of anesthesia.
10. Describe the common surgical medications and solutions.
11. Anesthesia and adjunct medications
12. Pre-medications, induction agents, muscle relaxants, narcotics, antibiotics, inhalation agents.
15. Describe the use of hypothermia and muscle relaxants as an adjunct to anesthesia.
16. Explain characteristics and use of contrast media and dyes in the operating room.

MCC Form EDU 0007 (rev. 10/07/11)
17. Identify, mix, measure, and pour medications for use on the sterile field.
18. Characterize the role of the surgical technologist in safe handling of drugs according to operating room policies and procedures.
# Course Competencies and Objectives

## By the end of the semester, students will be able to:

### Competency 1
The student will be able to describe some common pharmacological terms, define the sources of some commonly used drugs, drug classifications and categories, the procedure for medication orders, drug distribution systems, drug forms and preparations, drug administration routes, and pharmacokinetics and pharmacodynamics.

- **Objective 1.1** Define terms and abbreviations related to pharmacology.
- **Objective 1.2** List sources of drugs and give an example of each.
- **Objective 1.3** List four drug classification categories and identify several subcategories in each.
- **Objective 1.4** Discuss medication orders used in surgery.
- **Objective 1.5** List the parts of a medication order.
- **Objective 1.6** Describe the drug distribution systems used in hospitals.
- **Objective 1.7** List types of drug forms.
- **Objective 1.8** Discuss the medication administration routes used in surgery.
- **Objective 1.9** Describe the four processes of pharmacokinetics.
- **Objective 1.10** Outline aspects of pharmacodynamics.

### Competency 2
The student will be able to describe the major federal classification schedules regulating drugs; the role of JCAHO in accrediting health care organizations and programs and its standards for abbreviations and symbols; the phases of human medication testing; how to read and interpret a medication label; and describe the major medication reference guides.

- **Objective 2.1** Discuss federal and state roles in regulating drugs.
- **Objective 2.2** Delineate medication development and testing.
- **Objective 2.3** Define pharmacogenetics and pharmacogenomics.
- **Objective 2.4** Distinguish brand, generic, and chemical medication names.
- **Objective 2.5** List information found on medication labels.
- **Objective 2.6** Obtain medication information from pharmacology resources.

### Competency 3
The student will be able to describe the role of mathematics in pharmacology such as converting standard time to military time and how to solve simple problems, perform fundamental calculations, and make important conversions.

- **Objective 3.1** Convert civilian time to military time.
- **Objective 3.2** Define terminology, abbreviations, and symbols used in basic mathematics and measurement systems.
- **Objective 3.3** Use fractions in conversions and calculations.
- **Objective 3.4** Read and write decimals accurately.
- **Objective 3.5** Use decimals in conversions and calculations.
- **Objective 3.6** Convert between fractions and decimals.
- **Objective 3.7** Define percentages.
- **Objective 3.8** Convert between percentages and decimals and between percentages and fractions.
- **Objective 3.9** Delineate ratios and proportions.
- **Objective 3.10** Use ratios and proportions to solve problems.
- **Objective 3.11** Convert temperatures between the Fahrenheit and Celsius scales.
- **Objective 3.12** Define the metric system of measurements and explain how it is used as the international standard.
- **Objective 3.13** Classify other systems of measurement and their medical applications.
- **Objective 3.14** Identify symbols of measurement and measurement equivalents.

### Competency 4
The student will be able to describe the surgical technologist’s roles in medication administration, the “six rights” of medication administration, proper medication identification and delivery to the sterile field, and advanced medication administration practices for the surgical first assistant.

- **Objective 4.1** Describe the role of the surgical technologist in medication administration.
- **Objective 4.2** Explain the six “rights” of medication administration.
- **Objective 4.3** Describe the steps of medication identification.
- **Objective 4.4** Discuss aseptic techniques for delivery of medications to the sterile field.
### Competency 5

The student will be able to describe general terms used in referring to antimicrobial agents and procedures, how antimicrobials are classified and how they work, how antibiotic resistance occurs, and categories of antibiotics commonly used in surgical procedures.

- **Objective 5.1** Define terminology related to antimicrobial therapy.
- **Objective 5.2** Discuss the purpose of antibiotic therapy in surgery.
- **Objective 5.3** Describe various ways in which antimicrobials work.
- **Objective 5.4** Discuss antibiotic resistance.
- **Objective 5.5** List categories of antibiotics used in surgery and give examples of each.
- **Objective 5.6** Identify the category of various antibiotics.
- **Objective 5.7** Use drug resources to gather pertinent information on antibiotics.

### Competency 6

The student will be able to describe the elements and compositions of contrast media used in radiography, and which types are used in various procedures; describe the different types and classes of diuretics, why and how they are administered and their effects.

- **Objective 6.1** Define contrast media, dyes, and staining agents.
- **Objective 6.2** Give examples of contrast media and how each is used in radiographic studies in surgery.
- **Objective 6.3** Give examples of dyes and how each is used in surgical procedures.
- **Objective 6.4** Give examples of staining agents and how each is used in surgical procedures.
- **Objective 6.5** State the general purpose of a diuretic.
- **Objective 6.6** Describe the physiology of the kidney.
- **Objective 6.7** Identify anatomic structures of the nephron.
- **Objective 6.8** List diseases that use diuretics for management.
- **Objective 6.9** Describe the impact of long-term diuretic therapy on the patient about to undergo a surgical procedure.
- **Objective 6.10** Discuss the type of patient who may come to surgery on long-term diuretic therapy.
- **Objective 6.11** Differentiate between the purposes for long-term and short-term use of diuretics.
- **Objective 6.12** List the two most common diuretics administered intraoperatively and their purpose.

### Competency 7

The student will be able to describe the endocrine glands and the hormones each gland produces; functions of hormones, how they are used in medicine and surgery and which ones are administered during a surgical procedure; describe the uses of coagulants, hemostatics and systemic coagulants; the types and uses of anticoagulants and medications that affect coagulation.

- **Objective 7.1** Define terminology related to the endocrine system.
- **Objective 7.2** List endocrine glands and hormones secreted by each.
- **Objective 7.3** State the purpose for administration of each hormone.
- **Objective 7.4** Describe medical and surgical uses for hormones.
- **Objective 7.5** List hormones that may be administered from the sterile field.
- **Objective 7.6** List procedures that may require administration of hormones from the sterile field.
- **Objective 7.7** Define terms related to blood coagulation and medications that affect coagulation.
- **Objective 7.8** Describe the physiology of blood clot formation.
- **Objective 7.9** List agents that affect coagulation by category.
- **Objective 7.10** Identify the category of various agents that affect coagulation.
- **Objective 7.11** State the purpose of each category of medications that affect coagulation.
- **Objective 7.12** Explain the action of medications that affect coagulation.
- **Objective 7.13** List uses, routes of administration, side effects, and contraindications for agents that affect coagulation.
- **Objective 7.14** Identify the impact of preoperative oral anticoagulant therapy on the surgical patient.
- **Objective 7.15** List examples of surgical procedures in which agents that affect coagulation may be administered.
- **Objective 7.16** Compare and contrast administration route, onset of action, antagonist, and purpose of parenteral and oral anticoagulants.
- **Objective 7.17** List the administration route for each medication that affects coagulation.

### Competency 8

The student will be able to describe the anatomy of the eye including accessory structures such as the eyebrows and eyelids; list the categories of ophthalmic agents and the purpose of each.
category; cite some ophthalmic medications used in surgery and how they are used; describe the causes of fluid loss in surgery and methods of fluid replacement, some of the intravenous equipment and supplies used and terminology relating to blood replacement; list some basic irrigation solutions and their uses in surgery.

Objective 8.1 Describe the basic anatomy of the eye.
Objective 8.2 Define terminology related to ophthalmic medications.
Objective 8.3 State the purpose of each category of ophthalmic medications.
Objective 8.4 List examples of ophthalmic medications in each category.
Objective 8.5 Describe how ophthalmic agents are used in surgery.
Objective 8.6 Briefly describe the physiology of fluid loss in the surgical patient.
Objective 8.7 List fluid electrolytes and their functions crucial to homeostasis.
Objective 8.8 Define terms and abbreviations related to fluid replacement.
Objective 8.9 State objectives of parenteral fluid therapy in surgery.
Objective 8.10 Delineate common intravenous solutions and their purposes in surgery.
Objective 8.11 Outline supplies needed to start an intravenous line.
Objective 8.12 Explain basic functions and types of blood.
Objective 8.13 State average adult circulating volume of blood, hemoglobin, and hematocrit values.
Objective 8.14 Identify the formed elements present in blood.
Objective 8.15 Define terms and abbreviations related to blood.
Objective 8.16 Briefly describe antigen-antibody interactions in blood types.
Objective 8.17 List and describe indications for blood replacement in the surgical patient.
Objective 8.18 Explain available options for blood replacement.
Objective 8.19 Delineate components of whole blood used for replacement.
Objective 8.20 Define autologous and homologous blood donation.
Objective 8.21 Describe the process of intraoperative autotransfusion.
Objective 8.22 Identify volume expander solutions used in surgery.
Objective 8.23 List blood substitutes used in clinical trials.
Objective 8.24 Describe the procedure for blood replacement in surgery using donor blood from the blood bank.
Objective 8.25 Delineate and describe fluids used as irrigation solutions in surgery.
Objective 8.26 Detail and describe supplies and equipment used for irrigation.

Competency 9 The student will be able to describe the various pharmaceutical agents used in chemotherapy to treat cancer, biologic response modifiers that are used in conjunction with chemotherapy, some examples of carcinogens and new advances in cancer treatment.

Objective 9.1 Define the terms related to cancer.
Objective 9.2 Discuss different types of abnormal cell growth.
Objective 9.3 List the classifications of antineoplastic agents.
Objective 9.4 Detail biologic response modifiers.
Objective 9.5 Describe the most prevalent carcinogen in the United States.
Objective 9.6 Discuss nanotechnology and its applications in medicine.

Competency 10 The student will be able to describe the elements of a preoperative evaluation including a preanesthesia assessment and its purpose, some common medications that are administered preoperatively and their purposes.

Objective 10.1 Define terminology related to preoperative medications.
Objective 10.2 Identify the purpose of preoperative patient evaluation.
Objective 10.3 Describe sources of patient information used for preoperative evaluation.
Objective 10.4 List the components of a preoperative evaluation.
Objective 10.5 Identify classification of preoperative medications.
Objective 10.6 Delineate the purpose of each group of preoperative medications.
Objective 10.7 State examples of medications in each classification.

Competency 11 The student will be able to describe the procedures and devices involved in patient monitoring before, during and after surgery, the different types of anesthesia and their effects, and agents used for local anesthesia.

Objective 11.1 Define terminology related to patient monitoring and anesthesia.
### Competency 11
The student will be able to describe types of patient-monitoring devices.

- **Objective 11.2** Describe types of patient-monitoring devices.
- **Objective 11.3** Compare and contrast local anesthesia, monitored anesthesia care, and regional anesthesia.
  - **Objective 11.4** List surgical procedures that may be performed under local or regional anesthesia.
  - **Objective 11.5** Identify common agents used in local anesthesia and regional anesthesia.
  - **Objective 11.6** Discuss the use of epinephrine in local anesthetic agents.
  - **Objective 11.7** Describe types of regional blocks.

### Competency 12
The student will be able to describe the components of general anesthesia, administration methods, phases, the maintenance phase, agents used, major categories of anesthesia medications, inhalation agents, neuromuscular blocking agents and reversal agents.

- **Objective 12.1** Define terminology related to anesthesia.
- **Objective 12.2** Discuss indications for general anesthesia.
- **Objective 12.3** Identify anesthesia equipment.
- **Objective 12.4** Explain the basic components of a general anesthetic.
- **Objective 12.5** List methods of inducing general anesthesia.
- **Objective 12.6** Delineate the phases of general anesthesia.
- **Objective 12.7** Discuss options for airway management.
- **Objective 12.8** Explain the process of endotracheal intubation.
- **Objective 12.9** Discuss the concept of awareness under anesthesia.
- **Objective 12.10** List agents used to accomplish general anesthesia.
- **Objective 12.11** Identify the purposes and categories of agents used in general anesthesia.
- **Objective 12.12** Differentiate generic and trade names of common agents used in anesthesia.
- **Objective 12.13** State the phase of anesthesia in which various agents are administered.
- **Objective 12.14** Compare and contrast depolarizing and nondepolarizing muscle relaxants.

### Competency 13
The student will be able to describe some major anesthesia-related emergency situations, how they are treated and which drugs are used to treat them.

- **Objective 13.1** Define terminology related to emergency situations.
- **Objective 13.2** Give examples of emergency situations associated with anesthesia.
- **Objective 13.3** Identify medications used in emergency situations.
- **Objective 13.4** State the purpose of drugs used in emergency situations.
- **Objective 13.5** Identify the category of specified emergency medications.
- **Objective 13.6** Describe the category of specified emergency medications.
- **Objective 13.7** List clinical signs of malignant hyperthermia.
- **Objective 13.8** Outline basic course of treatment for malignant hyperthermia.
- **Objective 13.9** Discuss the role of the surgical technologist in a malignant hyperthermia crisis.