EASTERN ARIZONA COLLEGE
Sterile Products and Compounding
Course Design
2013-2014

Course Information
Division Allied Health
Course Number HCE 175
Title Sterile Products and Compounding
Credits 4
Developed by Dr. Mayuree Siripoon, RN, DNS, FNP-BC
Lecture/Lab Ratio 4 Lecture/0 Lab
Transfer Status

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Activity Course No
CIP Code 51.0800
Assessment Mode Pre/Post Test (100 Questions/100 Points)
Semester Taught Spring
GE Category None
 Separate Lab No
Awareness Course No
Intensive Writing Course No

Prerequisites
None

Educational Value
This course is designed for pharmacy technician students. It provides knowledge and skills relating to competencies required in the pharmacy technician program.

Description
This course introduces the concepts of sterile products, pharmaceutical compounding, and comprehensive review for national certification. It is designed for pharmacy technician students. The content includes extemporaneous compounding and compounded sterile products. Students will be acquainted with compounding equipment and use, compounding solutions, syrups, suspension, dry powders, capsules, lozenges, ointments, cream, gels, pastes, and suppositories. Student will learn introduction to microbiology and aseptic technique, UPS Chapter 797 Guidelines for compounded sterile products, large- and small-volume parenteral, total parenteral nutrition (TPN) and compounding sterile chemotherapeutic products. This course also includes comprehensive review of content in preparation for the national certification exam.
Supplies
None

Competencies and Performance Standards

1. Identify compounding equipment and use.

   Learning objectives
   What you will learn as you master the competency:
   a. Discuss rationale and guidelines for extemporaneous compounding.
   b. Identify compounding equipment used to measure volume
   c. Level a prescription torsion balance and demonstrate weighing procedures
   d. Identify types of mortars and pestles and discuss the rationale for their use
   e. List dosage forms and routes of administration for compounded products

   Performance Standards
   Competence will be demonstrated:
   o On assigned activities and written exams.

   Performance will be satisfactory when:
   o Learner responds correctly to exam questions.

2. Compound solutions, syrups, and suspensions.

   Learning objectives
   What you will learn as you master the competency:
   a. List characteristics of solution, syrups, and suspensions.
   b. Differentiate between the three types of liquids.
   c. Describe compounding procedures for each liquid preparation.
   d. Calculate expiration dates and storage requirements for compounded liquids.

   Performance Standards
   Competence will be demonstrated:
   o On assigned activities and written exams.

   Performance will be satisfactory when:
   o Learner responds correctly to exam questions.

3. Compound dry powders, capsules, and lozenges.

   Learning objectives
   What you will learn as you master the competency:
   a. Describe the topical effect of chemicals used in dry powder formulations.
   b. Discuss reasons for triturating topical dry powders into fine, evenly mixed particles.
   c. List advantages of using capsules as a compounded dosage form.
   d. Demonstrate the punch method of making capsules.
   e. Discuss three ways to make lozenges as a dosage form.

   Performance Standards
   Competence will be demonstrated:
   o On assigned activities and written exams.
4. **Compound ointments, creams, gels, pastes, and suppositories.**

   **Learning objectives**

   *What you will learn as you master the competency:*

   a. Discuss the advantages and disadvantages of topical preparations.
   b. Define compounding techniques used in extemporaneous compounding of ointments, creams, and suppositories.
   c. Discuss beyond-use dating for topical preparations.
   d. Demonstrate the ability to evaluate topical formulation for consistency, stability, and pharmaceutical elegance.
   e. List some factors to consider when preparing a suppository formulation.

   **Performance Standards**

   *Competence will be demonstrated:*

   o On assigned activities and written exams.

   *Performance will be satisfactory when:*

   o Learner responds correctly to exam questions.

5. **Follow aseptic technique.**

   **Learning objectives**

   *What you will learn as you master the competency:*

   a. Define microbiology and explain the importance of understanding the relationship of microbial contamination and aseptic technique.
   b. Differentiate between types of infective agents
   c. Discuss how microbial oxygen use and temperature affect the viability of an organism.
   d. List portal of entry and transmission methods for microbial contamination.
   e. Define human microbe relationships.

   **Performance Standards**

   *Competence will be demonstrated:*

   o On assigned activities and written exams.

   *Performance will be satisfactory when:*

   o Learner responds correctly to exam questions.

6. **Adhere to USP Chapter 797 Guidelines for compounded sterile products.**

   **Learning objectives**

   *What you will learn as you master the competency:*

   a. Discuss the technician’s responsibility to ensure the sterility of compounded sterile products.
   b. Outline proper hand-washing, gowning, and gloving procedures.
   c. Establish cleaning procedures for the cleanroom.
   d. Describe the anteroom requirements and procedures for bringing supplies into the cleanroom.
   e. Describe operation of both a horizontal and a vertical laminar airflow (LAF) workbench.
f. Differentiate between procedures for using a glove box and an open workbench.
g. Demonstrate procedure for performing IV admixture using aseptic technique.

**Performance Standards**

*Competence will be demonstrated:*
- On assigned activities and written exams.

*Performance will be satisfactory when:*
- Learner responds correctly to exam questions.

7. **Acquaint self with large- and small-volume parenteral.**

**Learning objectives**

*What you will learn as you master the competency:*

a. Define parenteral products and explain the reasons for using them.
b. Discuss the disadvantages of parenteral routes of administration.
c. Differentiate between large- and small-volume parenteral.
d. Outline factors involved in determining beyond-use dating.
e. List labeling requirements for compounded parenteral products.
f. Outline storage requirements for compounded parenteral products.

**Performance Standards**

*Competence will be demonstrated:*
- On assigned activities and written exams.

*Performance will be satisfactory when:*
- Learner responds correctly to exam questions.

8. **Describe total parenteral nutrition (TPN).**

**Learning objectives**

*What you will learn as you master the competency:*

a. List types of patients who require total parenteral nutrition (TPN).
b. Outline the basic types of ingredients in TPN.
c. Discuss the advantages of having standard TPN formulas.
d. Describe the use of automated compounders for compounding TPNs.
e. List quality-assurance initiatives required by USP Chapter 797.

**Performance Standards**

*Competence will be demonstrated:*
- On assigned activities and written exams.

*Performance will be satisfactory when:*
- Learner responds correctly to exam questions.

9. **Familiar with compounding sterile chemotherapeutic products.**

**Learning objectives**

*What you will learn as you master the competency:*

a. List types of chemotherapeutic drugs that may be hazardous.
b. Detail precautions to protect the compounder from harm.

c. Contrast the aseptic manipulations in a horizontal flow hood with those in a vertical flow hood.

d. Identify the components of a hazardous spill kit and describe their use.

e. Illustrate labeling and packaging requirements for a sterile chemotherapeutic compound.

**Performance Standards**

*Competence will be demonstrated:*

- On assigned activities and written exams.

*Performance will be satisfactory when:*

- Learner responds correctly to exam questions.

10. **Recognize professionalism and career exploration.**

**Learning objectives**

*What you will learn as you master the competency:*

a. List professional organizations that are pertinent to the pharmacy technician profession.

b. Outline the importance of each organization to the profession.

c. Discuss reasons for technicians to maintain memberships in professional organizations.

d. Plan ways to work with an organization to enhance the profession.

e. Name the two national certification examinations.

f. Detail a plan to keep current through continuing education.

**Performance Standards**

*Competence will be demonstrated:*

- On assigned activities and written exams.

*Performance will be satisfactory when:*

- Learner responds correctly to exam questions.

11. **Expand horizons for technicians.**

**Learning objectives**

*What you will learn as you master the competency:*

a. List specialty areas for experienced technicians.

b. Explore other positions using the knowledge and skills of technicians.

c. Develop a career ladder for technicians.

d. Construct a professional resume including knowledge and skills.

e. Search for professional opportunities

**Performance Standards**

*Competence will be demonstrated:*

- On assigned activities and written exams.

*Performance will be satisfactory when:*

- Learner responds correctly to exam questions.

12. **Review comprehensive pharmacy technician content for national certification exam.**

**Learning objectives**
What you will learn as you master the competency:

a. Review role of the pharmacy technician in pharmacy practice.
b. Review pharmacy calculations, abbreviations, and terminology.
c. Review pharmacy governance.
d. Review drug classifications and formulations.
e. Review prescription dispensing.
f. Review maintaining medication and inventory control systems.
g. Review assisting with pharmacy administration and management
h. Practice simulated national certification exams

Performance Standards

Competence will be demonstrated:

- On assigned activities and written exams.

Performance will be satisfactory when:

- Learner responds correctly to exam questions.

Types of Instruction

Classroom presentation and discussions.

Grading Information

Grading Rationale

A pretest will be administered at the beginning of the course, and a posttest at the end of the course. They will not count as part of the final grade. Five unit examinations will count as 75% of the final course grade. The final exam will count as 25% of the final course grade.

Grading Scale

A  90-100%
B  80-89%
C  70-79%
D  60-69%
F  0-59%