

## COURSE OUTLINE

**PROGRAM:** Pharmacy Technician Bridging Education Program

**COURSE NAME:** Product Preparation

**COURSE DURATION:** 33 hours

**PRIOR LEARNING ASSESSMENT AND RECOGNITION:**

CH Exam X

Portfolio \_\_\_\_\_

N/A \_\_\_\_\_

### I. COURSE DESCRIPTION

This course addresses the theoretical knowledge and practical skills essential for safe and accurate preparation of sterile and non-sterile pharmaceutical products. For non-sterile preparation, students will focus on compounding practices for various internal and external preparations and specialty dosage forms, equipment and tools, professional guidelines, standards and legislation, pharmaceutical calculations, and documentation requirements. For sterile product preparation, areas of emphasis include infection control, aseptic technique, parenteral dosage forms, accurate calculations, appropriate use of equipment, and quality control. Best practices associated with the preparation of TPN and antineoplastics are also covered.

### II. COURSE OVERVIEW

Unit Number	Unit Name	Time in Hours
I	Extemporaneous Compounding	10 hours
II	Extemporaneous Specialty	2 hours
III	Sterile Product Preparation	15 hours
IV	Sterile Specialty Products (antineoplastics)	6 hours

### III. VOCATIONAL LEARNING OUTCOMES

On completion of this course, participants will have reliably demonstrated the ability to:

- 1.0 Safely and accurately compound a non-sterile mixture, according to a predetermined master formula sheet, with emphasis on efficiency, good compounding practices and Workplace Hazardous Materials Information Systems (WHMIS) guidelines.**

**Learning Elements:**

- 1.1 Calculate quantities needed to compound a product, using various mathematical operations and master formula sheets.
  - 1.2 Solve problems relating to pharmaceutical calculations – dilutions, dosage calculations and conversions using common fractions, decimal fractions, ratios, proportions and percentages.
  - 1.3 Detect errors when verifying calculations.
  - 1.4 Accurately interpret terminology and compounding directions used in written procedures and master formula sheets.
  - 1.5 Identify the appropriate purpose of ingredients.
  - 1.6 Discuss the use of pharmaceutical ingredients to enhance form, palatability or appearance and patient compliance.
  - 1.7 Select and use credible reference materials and online resources effectively, including USP Chapter 797.
  - 1.8 Discuss the selection of appropriate equipment and supplies for non-sterile compounding.
  - 1.9 Discuss procedures for accurately weighing and measuring ingredients.
  - 1.10 Develop an effective checklist for appropriate final release of the product.
  - 1.11 Describe appropriate techniques for compounding extemporaneous product(s) accurately.
  - 1.12 Demonstrate correct packaging and labeling of the finished product, including determination of expiry dates, stability and storage guidelines.
  - 1.13 Complete master formula sheets.
- 2.0` Outline special procedures and guidelines for compounding specialty extemporaneous products, including specialty dosage forms and products containing narcotics.**

**Learning Elements:**

- 2.1 Summarize legislative and other guidelines that govern the use of narcotics and controlled drugs in extemporaneous compounding.
- 2.2 Describe special procedures that need to be taken when compounding extemporaneous mixtures containing narcotics.
- 2.3 Outline the advantages and disadvantages of the following “specialty” dosage forms: patch, troche, suppository, lollipop, lozenge, capsule, tincture, paste, spray, powder.
- 2.4 Complete pharmaceutical calculations required for the preparation of various prescriptions for specialty products.

- 3.0 Discuss procedures for safe and accurate preparation of sterile IV admixture(s) in a Laminar Air Flow Hood (LAFH) with emphasis on aseptic technique and the standards established by the Canadian Society of Hospital Pharmacists (CSHP), and the USP Chapter 797 standard.**

### Learning Elements

- 3.1 Define aseptic technique and key principles essential for ensuring a sterile product.
  - 3.2 Identify common potential contaminants (microbial and physical) of sterile products.
  - 3.3 Describe routes of parenteral administration.
  - 3.4 Calculate quantities needed to prepare various IV admixtures, using appropriate mathematical operations.
  - 3.5 Solve mathematical problems related to pharmaceutical calculations including dilutions, percentages, conversions, alligations, IV flow rates and daily volumes.
  - 3.6 Discuss procedures for proper hand washing, gloving and gowning.
  - 3.7 Describe the operations of the horizontal and vertical Laminar Air Flow Hood, and appropriate cleaning procedures.
  - 3.8 Outline best practices for setup of materials and supplies to maintain a sterile environment and identify sources of contamination.
  - 3.9 Identify critical sites of sterile materials.
  - 3.10 Demonstrate appropriate aseptic technique for the handling of needles, and syringes, withdrawal from vials and glass ampoules, injection into a minibag and reconstitution.
  - 3.11 Discuss selection of correctly sized packaging and labeling procedures for a syringe, mini bag and large volume parenterals.
- 4.0 Discuss procedures for safe and accurate preparation of TPN in a Laminar Air Flow Hood (LAFH) with emphasis on aseptic technique and compliance with the standards established by the Canadian Society of Hospital Pharmacists (CSHP), and USP Chapter 797.**

### Learning Elements

- 4.1 Discuss the definition, purpose and types of TPN (Total Parenteral Nutrition).
- 4.2 Describe the routes of administration.
- 4.3 Discuss the compatibility of specific additives.
- 4.4 Accurately complete calculations and conversions to determine volumes of medications and diluents.
- 4.5 Outline criteria for selecting the correct size and strength of TPN bag.
- 4.7 Explain procedures required for the proper setup of materials and supplies while maintaining a sterile environment.
- 4.8 Determine the correct sequencing of specific additives to the TPN bag, emphasizing aseptic techniques to be practiced with this step.
- 4.9 Outline requirements for a TPN worksheet and label, applying knowledge of expiry dates, stability and storage guidelines.

**5.0 Outline procedures for safely and accurate preparation of antineoplastic medications in a Biological Safety Cabinet, with emphasis on aseptic technique and compliance with the standards established by the Canadian Society of Hospital Pharmacists (CSHP), Ontario College of Pharmacists (OCP), and USP Chapter 797.**

### Learning Elements

- 5.1 Discuss hazards involved in handling and preparing antineoplastic medications
- 5.2 Discuss appropriate procedures for disposal of cytotoxic supplies, materials and medications and the cleanup of cytotoxic spills.
- 5.3 Demonstrate the operation of the biological safety cabinet and appropriate cleaning procedures.
- 5.4 Discuss gloving and gowning procedures and other precautionary measures associated with appropriate use of the equipment.
- 5.5 Describe the specialized techniques required in the preparation of antineoplastics doses.
- 5.6 Discuss procedures for appropriate packaging, labeling and delivery of antineoplastics doses.

**NOTE: It is not within the scope of the Pharmacy Technician Bridging Program to ensure that course participants are fully competent in sterile and non-sterile product preparation. As a result, the opportunities for practical, hands-on practice are limited. The goal is to refresh your understanding of the principles and best practices involved in sterile and non-sterile preparation and provide opportunity for basic practice either in the classroom or at home. If your skills are deficient, you need to look for ways to enhance your performance of these techniques. It is your responsibility as a self-regulated professional to avoid assuming responsibility on the job for tasks for which you are not fully prepared.**

### IV. ASSESSMENT OF LEARNING

Assessment Method	% of Final Grade	Associated Outcome(s)	Week Due
Test # 1	20%	LO 1	Week 4
Methadone Assignment	10%	LO 2	Week 5
Test # 2	25%	LO 2, 3	Week 8
Quizzes (5)	10%	LO 1, 2, 3 and 4	Weeks 2, 5, 6, 7, & 9
Final Exam	35%	LO 1, 2, 3, 4 and 5	Week 11

**Note to Instructor: It is important that students understand how assignments and tests are evaluated before they begin working on them. Please make certain to discuss the marking scheme and expectations for assignment/tests as they are assigned.**

### Important Notes

- 1) In addition, to successfully complete the course, students are required to submit two compounding assignments completed in the work place. Week 10 is the deadline for submission of these assignments. Failure to submit these assignments will result in a grade

of zero for the course. These assignments will be assessed using a Requirements Met/Not Met designation.

- 2) Assignments must be submitted directly to the instructor and are due at the beginning of class on the scheduled due date. Late submission of assignments or papers without the professor's consent will result in a 20% per day reduction. After 5 days, including weekends and holidays, the assignment or paper will receive a grade of zero. All assignments must be submitted to complete the course.
- 3) Cheating and/or plagiarism will not be tolerated. It should be noted that sharing information or seeking advance notice from colleagues about the content and format of tests, examinations or assignments is a clear example of academic dishonesty. Instances of academic dishonesty are subject to the policies and penalties established by the college delivering this course.

### **Grading:**

An overall average of 70%, with a passing grade of at least 70% on the final exam is required for successful completion of the course. No supplemental examinations will be provided. This practice is consistent across the Pharmacy Technician Bridging Program and overrides individual college policies regarding provision of supplemental examinations.

**Attendance is mandatory.**

## **V. REQUIRED TEXTS AND OTHER LEARNING MATERIALS**

Purchase of a materials kit is required.

A four-function calculator. (Students will be permitted to use a non-scientific calculator during tests and the final examination.)

For additional practice with pharmaceutical calculations, students are encouraged to access any of the following web sites:

[http://wps.prenhall.com/chet\\_olsen\\_medicaldosage\\_8](http://wps.prenhall.com/chet_olsen_medicaldosage_8)

<http://www.allysion.org/dimensional/analysis.htm#myadventure>

<http://www.allysion.org/dimensional/daexamples.htm>

<http://www.delta.edu/tlc/TLCStudySupport/mathforscience/NursingMath/healthmath.html>

<http://www.accd.edu/sac/nursing/math/peds5.html>

<http://www.unc.edu/~bangel/quiz/testiv.htm>

<http://www.unc.edu/~bangel/quiz/testflu.htm>

[http://www.quia.com/servlets/quia.activities.common.ActivityPlayer?AP\\_rand=1259005221&AP\\_activityType=3&AP\\_urlId=382242&AP\\_continuePlay=true382242](http://www.quia.com/servlets/quia.activities.common.ActivityPlayer?AP_rand=1259005221&AP_activityType=3&AP_urlId=382242&AP_continuePlay=true382242)