# PHT 103: PHARMACY CAREERS C

## Foothill College Course Outline of Record

| Heading | Value |
|---|---|
| **Units:** | 4 |
| **Hours:** | 4 lecture per week (48 total per quarter) |
| **Prerequisite:** | PHT 102. |
| **Degree & Credit Status:** | Degree-Applicable Credit Course |
| **Foothill GE:** | Non-GE |
| **Transferable:** | None |
| **Grade Type:** | Letter Grade (Request for Pass/No Pass) |
| **Repeatability:** | Not Repeatable |

## Student Learning Outcomes

- Calculate the correct medication safe dosages of drugs using information derived from prescriptions, drug labels, package inserts and medical orders using proper medical and pharmaceutical notation.
- Accurately calculate and utilize the required ingredients for compounding pharmaceutical products from the various physician orders.
- Identify common pathophysiology of the renal/urological and musculoskeletal systems and the prescription and non-prescription remedies, side effects and dosages of the treatments.
- State the requirements for admission,technical standards, schedule,legal requirements of the Pharmacy Technician Program and federal and state laws correlated to the profession

## Description

The final course in a series of three; intended for students enrolled in the CTE Pharmacy Careers Pathway Program. This course continues to build on topics pertaining to the following areas: pharmaceutical compounding, various dosage formulations, complementary and alternative medicine, pharmaceutical calculations used in community and institutional practice, basic anatomy, physiology, and medical terminology pertaining to the renal/urological and musculoskeletal systems, including diseases and medications used to treat conditions affecting these systems. It also covers California Board of Pharmacy requirements for technicians and provides an overview of the Foothill College Pharmacy Technician Program.

## Course Objectives

The student will be able to:
A. Demonstrate working knowledge of various pharmaceutical equipment and supplies.
B. Identify and differentiate between various solid and liquid dosage forms for oral and topical use.
C. Describe the advantages and disadvantages of various solid and liquid dosage forms for oral use.
D. Recognize specific uses for various solid and liquid dosage forms for oral and topical use.
E. Describe the different storage requirements and safety considerations of various classifications of pharmaceuticals.
F. Define, interpret, communicate, apply and apply medical terminology for the renal and urological system and musculoskeletal system.
G. Describe the basic anatomy and pathophysiology of the renal and urological system.
H. Identify common prescription and non-prescription medication and remedies for the treatment of disease states correlated with the renal and urological system.
I. Describe the basic anatomy and pathophysiology of the musculoskeletal system.
J. Identify common prescription and non-prescription medication and remedies for the treatment of disease states correlated with the musculoskeletal.
K. Define Complementary and Alternative Medicine and describe CAM therapies currently used.
L. Recognize the most common herbal products used and the conditions they treat.
M. Understand potential risks, such as side effects and drug herbal interactions, that can occur with herbal product use.
N. Discuss the vitamins and minerals commonly used in pharmaceutical preparations and explain the pharmacology of these vitamins and minerals.
O. Demonstrate understanding of mathematical calculations, such as inventory control, discounts, gross and net profits, and cash register calculations.
P. Demonstrate understanding of mathematical calculations involved in parenteral doses, powdered drug preparations and percentages by using ratio and proportion and dimensional analysis.
Q. Compute medication dosages required by ascertaining information from medication labels and drug orders.
R. Demonstrate understanding of mathematical calculations involved in dosage calculations based on weight and body surface area.
S. Describe the Foothill College Pharmacy Technology curriculum.
T. State the requirements and explain the application process for the Foothill College Pharmacy Technician Program.
U. Describe in writing California state requirements for registration.
V. Describe in writing the experience of visiting the Foothill College Pharmacy Technician Program.
W. Orally present the results from the visitation of a community pharmacy and interview a practicing pharmacy technician regarding the requirements needed to be successful in the field.

## Course Content

A. Pharmaceutical Compounding Equipment and Supplies
1. Graduated cylinders of various sizes
2. Amber oval vials of various sizes
3. Ointment jars of various sizes
4. Ointment tile
5. Ointment spatula
6. Glass beakers of various sizes
7. Mortar and pestle
8. Counting trays
9. Digital scale
10. Stirring rods
11. Weighing boats of various sizes
B. Oral Solid Dosage Forms
1. Terminology
2. Basic guidelines for oral administration
3. Powders
a. Preparation of various powders

4. Granules
5. Capsules
a. Hard gelatin
b. Soft gelatin
c. Controlled release
d. Extemporaneous preparation of commonly used capsules
6. Tablets
a. Multiple compressed
b. Sugar coated
c. Film coated
d. Enteric coated
e. Buccal or sublingual
f. Chewable
g. Gelatin coated compressed tablets
h. Lozenges
7. Oral solutions and uses
a. Definition and terminology
b. Solutes and solvents
c. Review percent strengths
d. Common oral solutions
1) Syrups
2) Elixirs
3) Extemporaneous compounding and packaging of various solutions, syrups, and elixirs
8. Oral suspensions and uses
a. Definition and terminology
b. Components
1) Emulsions
2) Magmas
3) Gels
4) Extemporaneous compounding and packaging of various suspensions and emulsions
C. Advantages and Disadvantages of Various Oral Dose Formulations
1. Powders
2. Capsules
3. Tablets
4. Solutions/syrups
5. Suspensions
6. Powders
D. Identification and Uses of Various Oral Dosage and Topical Forms
1. Liquid formulations
2. Solid formulations
3. Semisolid formulations
E. Storage and Packaging Requirements
1. Room temperature
2. Refrigeration
3. Freezer
F. Medical Terminology
1. The renal and urological system
a. Prefixes and suffixes
b. Abbreviations
2. The musculoskeletal system
a. Prefixes and suffixes
b. Abbreviations
G. The Renal and Urological System
1. Anatomy and physiology of the renal and urological system
a. Function of the kidneys
b. Nephron function
1) Tubular reabsorption
2) Tubular secretion
c. Importance of electrolytes
2. Conditions affecting the renal and urological systems
a. Chronic Kidney Disease
b. Kidney Stones
c. Edema
d. Urinary Tract Infection
e. Urinary Incontinence
f. Pyelonephritis
H. Common Therapeutic Agents Used to Treat Diseases of the Renal and Urological Systems
1. Therapeutic agents used for the treatment of:
a. Chronic Kidney Disease
b. Kidney Stones
c. Edema
d. Urinary Tract Infection
e. Urinary Incontinence
f. Pyelonephritis
I. The Musculoskeletal System
1. Anatomy and physiology of the skeletal system
a. Bones
1) Compact bone
2) Spongy bone
3) Bone marrow
b. Tendons
c. Ligaments
2. Anatomy and physiology of skeletal muscle
a. Muscle fibers
1) Actin
2) Myosin
b. Motor nerves
3. Conditions affecting the musculoskeletal system
a. Osteoarthritis
b. Osteoporosis
c. Gout
d. Muscle spams
J. Common Therapeutic Agents Used to Treat Diseases of the Musculoskeletal Systems
1. Therapeutic agents used for the treatment of:
a. Osteoarthritis
b. Osteoporosis
c. Gout
d. Muscle spams
K. Complementary and Alternative Medicine (CAM)
1. Importance in the healthcare system
2. Homeopathy
3. Chiropractic
4. Massage therapy
5. Acupuncture and acupressure
6. Natural remedies
7. Traditional Chinese medicine
8. Biofeedback
9. Facts and fiction
L. Herbal Products and Preparations
1. Garlic
2. Ginseng
3. Ginko
4. St. John's Wort
5. Chamomile
6. Saw Palmetto
7. Echinacea
M. Risks and Side Effects Associated with Herbal Preparations
N. Vitamins, Minerals, and Supplements
1. Nutritional requirements
2. Water soluble vitamins

3. Oil soluble vitamins
4. Minerals
5. Nutritional supplements
O. Calculations Within a Community Setting
1. Inventory control
a. Minimum and maximum level systems
b. Determining reorder quantities
c. Inventory affects in a pharmacy
2. Discounts
a. Calculate discounts using percentages
3. Gross and net profits
a. Selling price and acquisition costs
b. Dispensing fees
c. Calculate the gross profit and net profit for prescriptions
4. Cash register calculations
a. Making change for cash register transactions
b. Calculate change due when payment is different than what is due
P. Calculations for Parenterals
1. Parenteral doses
a. Ratio and proportion calculations
b. Dimensional analysis
2. Powdered drug preparations
a. Powder volume
b. Concentration of drug for reconstituted medications
c. Volume of reconstituted medications for a specific dose
Q. Computing Medication Dosages from Manufacturer's Label
1. Calculate volume of drug for a specific dose
2. Reconstitution of powdered medication
a. Oral
b. Parenteral
R. Dosage Calculations Based on Body Weight and Surface Area
1. Body weight conversions
a. Kilograms to pounds
b. Pounds to kilograms
2. Units of dosing per body weight
a. mcg/kg
b. mg/kg
c. g/kg
3. Body surface area
a. Nomograms
4. Dosing calculations based on BSA
S. Foothill Pharmacy Technician Program
1. ASHP/ACPE curriculum
a. Course requirements
1) Prerequisites
2) Program course work
a) Lecture courses
b) Lab courses
c) Grading policies
2. Financial requirements
3. Transportation requirements
4. Externships
T. Foothill College Pharmacy Technician Admission Criteria
1. Application process
U. Requirements for California State License
1. Specific state registration requirements
2. PTCE national board testing
V. Visitation to Foothill College Pharmacy Technician Program
1. Tour of facility and Foothill College campus
2. Shadowing and interviewing current Pharmacy Technician student
W. Pharmacy Visitation
1. Tour of pharmacy
2. Interview with pharmacy staff
a. Pharmacy Technician
b. Pharmacist

## Lab Content

Not applicable.

## Special Facilities and/or Equipment

A. Textbooks, charts, worksheets.
B. Audio visual aids, pharmacy clinical sites.
C. Library with generalized and specialized references.
D. Multimedia classroom.
E. Computer access.
F. Specialized pharmacy equipment.

## Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Evaluation methods may include, but are not limited to:
A. Objective and comprehensive exams
B. Quizzes
C. Worksheets
D. Reflections journal
E. Written research paper
F. Oral presentation
G. Class discussion participation
H. Cooperative/interactive learning assignments
I. Projects
J. Computer activities
K. Case studies

## Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

A. Lecture presentations and classroom discussion.
B. Small group recitation sessions to discuss concepts.
C. Cooperative/interactive learning exercises.
D. Online modules utilizing software programs.
E. Class demonstration and activities.
F. Individual or group presentations regarding research topics followed by in-class discussion and evaluation.

## Representative Text(s) and Other Materials

Instructor generated materials: PowerPoint slides, worksheets, class activities.
Davis, Karen, and Anthony Guerra. Mosby's Pharmacy Technician Principles and Practice. 5th ed. St. Louis: Elsevier, 2018.
Powers, Mary, and Janet Wakelin. Pharmacy Calculations. 5th ed. Englewood: Morton Publishing Company, 2016.

## Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

A. Weekly reading assignments from text and outside sources ranging from 10 to 20 pages per week

B. Lecture: Weekly lecture covering subject matter from text assignment with extended topic information along with class discussion
C. Review of handouts and relevant reading material
D. Participating in critical thinking and case study exercises
E. Exploring websites on related topics covered in lecture
F. Study Ware CD-ROM Student Study Activities
G. Completing review questions in textbook
H. Research and planning of individual projects
I. Completion of assigned online activities and projects
J. Individual reports (written and oral) based on research
K. Individual visitation of pharmacy
L. Reflection journal

## Discipline(s)

Pharmacy Technology