

**Health Science Career Cluster
Pharmacy Operations and Fundamentals
Course Number: 25.45300**

Course Description:

This course is an introduction to pharmacy technology professions, employment opportunities, and basic pre-pharmacy technician skills which may be utilized in either clinical or community settings such as retail, home health care, and ambulatory care pharmacies. Intensive pharmacy specific safety and security training are provided including potential drug addiction and abuse issues relative to pharmaceutical care such as robberies and identification of forgeries. Students are required to adhere to Federal Regulatory Agencies and Acts guidelines including Food, Drug, and Cosmetic Act, Controlled Substances Act (CSA), Joint Commission on Accreditation of Healthcare Organizations (JCAHO), Drug Enforcement Administration (DEA) in addition to the pharmacy regulatory agencies within the state of Georgia. This course is recommended for students planning on pursuing careers in the healthcare industry, which may require basic pharmaceutical knowledge, common healthcare mathematical applications, and/or technical proficiency in the administration medications. An overview of prescription and nonprescription medications, classifications, actions, and interactions is provided while critical thinking skills are developed throughout the course from initial calculations/conversions of drug dosage forms to the simulation of regulating IV infusion rates. Technical skills in the preparation and administration of medications are practiced in simulated clinical labs. Students must demonstrate the utilization of all professional and safety guidelines as designated by applicable Federal and State regulatory agencies and acts such as the Drug Enforcement Administration (DEA) and the Controlled Substance Act while performing simulations. The impact of pharmaceuticals on the provision of healthcare and the importance of client education are integrated throughout the course. Clinical experience is recommended to help prepare a student to potentially take the Pharmacy Technician exam when they are eligible. An internship course under the supervision of a Registered Pharmacist may also be utilized for this experience. After the completion of this course, students may be eligible to take the Pharmacy Technician Certification Exam (PTCE) through the Pharmacy Technician Certification Board (PTCB). The prerequisites for the course are Introduction to Healthcare Science and Essentials of Healthcare.

Course Standard 1

HS-POF-1

The following standard is included in all CTAE courses adopted for the Career Cluster/Pathways. Teachers should incorporate the elements of this standard into lesson plans during the course. The topics listed for each element of the standard may be addressed in differentiated instruction matching the content of each course. These elements may also be addressed with specific lessons from a variety of resources. This content is not to be treated as a unit or separate body of knowledge but rather integrated into class activities as applications of the concept.

Standard: Demonstrate employability skills required by business and industry.

The following elements should be integrated throughout the content of this course.

1.1 Communicate effectively through writing, speaking, listening, reading, and interpersonal abilities.

Person-to-Person Etiquette	Telephone and Email Etiquette	Cell Phone and Internet Etiquette	Communicating At Work	Listening
Interacting with Your Boss	Telephone Conversations	Using Blogs	Improving Communication Skills	Reasons, Benefits, and Barriers
Interacting with Subordinates	Barriers to Phone conversations	Using Social Media	Effective Oral Communication	Listening Strategies

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Interacting with Co-workers	Making and Returning Calls		Effective Written Communication	Ways We Filter What We Hear
Interacting with Suppliers	Making Cold Calls		Effective Nonverbal Skills	Developing a Listening Attitude
	Handling Conference Calls		Effective Word Use	Show You Are Listening
	Handling Unsolicited Calls		Giving and Receiving Feedback	Asking Questions
				Obtaining Feedback
				Getting Others to Listen

Nonverbal Communication	Written Communication	Speaking	Applications and Effective Résumés
Communicating Nonverbally	Writing Documents	Using Language Carefully	Completing a Job Application
Reading Body Language and mixed Messages	Constructive Criticism in Writing	One-on-One Conversations	Writing a Cover Letter
Matching Verbal and Nonverbal communication		Small Group Communication	Things to Include in a Résumé
Improving Nonverbal Indicators		Large Group Communication	Selling Yourself in a Résumé
Nonverbal Feedback		Making Speeches	Terms to Use in a Résumé
Showing Confidence Nonverbally		Involving the Audience	Describing Your Job Strengths
Showing Assertiveness		Answering Questions	Organizing Your Résumé
		Visual and Media Aids	Writing an Electronic Résumé
		Errors in Presentation	Dressing Up Your Résumé

1.2 Demonstrate creativity by asking challenging questions and applying innovative procedures and methods.

Teamwork and Problem Solving	Meeting Etiquette
Thinking Creatively	Preparation and Participation in Meetings
Taking Risks	Conducting Two-Person or Large Group Meetings
Building Team Communication	Inviting and Introducing Speakers
	Facilitating Discussions and Closing
	Preparing Visual Aids
	Virtual Meetings

1.3 Exhibit critical thinking and problem solving skills to locate, analyze and apply information in career planning and employment situations.

Problem Solving	Customer Service	The Application Process	Interviewing Skills	Finding the Right Job
Transferable Job Skills	Gaining Trust and Interacting with Customers	Providing Information, Accuracy and Double Checking	Preparing for an Interview	Locating Jobs and Networking
Becoming a Problem Solver	Learning and Giving Customers What They Want	Online Application Process	Questions to Ask in an Interview	Job Shopping Online
Identifying a Problem	Keeping Customers Coming Back	Following Up After Submitting an Application	Things to Include in a Career Portfolio	Job Search Websites
Becoming a Critical Thinker	Seeing the Customer's Point	Effective Résumés:	Traits Employers are Seeking	Participation in Job Fairs

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Managing	Selling Yourself and the Company	Matching Your Talents to a Job	Considerations Before Taking a Job	Searching the Classified Ads
	Handling Customer Complaints	When a Résumé Should be Used		Using Employment Agencies
	Strategies for Customer Service			Landing an Internship
				Staying Motivated to Search

1.4 Model work readiness traits required for success in the workplace including integrity, honesty, accountability, punctuality, time management, and respect for diversity.

Workplace Ethics	Personal Characteristics	Employer Expectations	Business Etiquette	Communicating at Work
Demonstrating Good Work Ethic	Demonstrating a Good Attitude	Behaviors Employers Expect	Language and Behavior	Handling Anger
Behaving Appropriately	Gaining and Showing Respect	Objectionable Behaviors	Keeping Information Confidential	Dealing with Difficult Coworkers
Maintaining Honesty	Demonstrating Responsibility	Establishing Credibility	Avoiding Gossip	Dealing with a Difficult Boss
Playing Fair	Showing Dependability	Demonstrating Your Skills	Appropriate Work Email	Dealing with Difficult Customers
Using Ethical Language	Being Courteous	Building Work Relationships	Cell Phone Etiquette	Dealing with Conflict
Showing Responsibility	Gaining Coworkers' Trust		Appropriate Work Texting	
Reducing Harassment	Persevering		Understanding Copyright	
Respecting Diversity	Handling Criticism		Social Networking	
Making Truthfulness a Habit	Showing Professionalism			
Leaving a Job Ethically				

1.5 Apply the appropriate skill sets to be productive in a changing, technological, diverse workplace to be able to work independently and apply team work skills.

Expected Work Traits	Teamwork	Time Management
Demonstrating Responsibility	Teamwork Skills	Managing Time
Dealing with Information Overload	Reasons Companies Use Teams	Putting First Things First
Transferable Job Skills	Decisions Teams Make	Juggling Many Priorities
Managing Change	Team Responsibilities	Overcoming Procrastination
Adopting a New Technology	Problems That Affect Teams	Organizing Workspace and Tasks
	Expressing Yourself on a Team	Staying Organized
	Giving and Receiving Constructive Criticism	Finding More Time
		Managing Projects
		Prioritizing Personal and Work Life

1.6 Present a professional image through appearance, behavior and language.

On-the-Job Etiquette	Person-to-Person Etiquette	Communication Etiquette	Presenting Yourself
Using Professional Manners	Meeting Business Acquaintances	Creating a Good Impression	Looking Professional
Introducing People	Meeting People for the First Time	Keeping Phone Calls Professional	Dressing for Success

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Appropriate Dress	Showing Politeness	Proper Use of Work Email	Showing a Professional Attitude
Business Meal Functions		Proper Use of Cell Phone	Using Good Posture
Behavior at Work Parties		Proper Use in Texting	Presenting Yourself to Associates
Behavior at Conventions			Accepting Criticism
International Etiquette			Demonstrating Leadership
Cross-Cultural Etiquette			
Working in a Cubicle			

Support of CTAE Foundation Course Standards and Georgia Standards of Excellence L9-10RST 1-10 and L9-10WHST 1-10:

Georgia Standards of Excellence ELA/Literacy standards have been written specifically for technical subjects and have been adopted as part of the official standards for all CTAE courses.

Course Standard 2

HS-POF-2

Trace the different types of pharmacies, identify the team members needed, and define terminology used in a pharmaceutical setting.

- 2.1 Differentiate the types of pharmacy practices found in community and hospital settings.
- 2.2 Discover pre-employment educational requirements, current employment options, and formulate a career path necessary for one option.
- 2.3 Distinguish members of the pharmacy team; differentiate between roles and responsibilities of team members, and designate all members in appropriate positions on the organizational chart.
- 2.4 Exhibit the appropriate use of pharmacology nomenclature to include terminology related to drug effects.
- 2.5 Demonstrate knowledge and skills in these areas of science relevant to the pharmacy technician role, including anatomy/physiology, pharmacology and basic pharmaceutical chemistry.
- 2.6 Explain the differentiation between the following concepts: pharmacokinetics and pharmacodynamics, drug and medication, customer and patient, efficacy and safety.
- 2.7 Identify natural sources of drugs and discuss how drugs are chemically produced or altered in laboratories.

Course Standard 3

HS-POF-3

Support and explain the need for safety and proper infection control in the pharmacy and demonstrate precautions to prevent medication errors.

- 3.1 Establish secured areas within the pharmacy and the personnel permitted in those areas.
- 3.2 Apply appropriate infection control techniques set forth by OSHA guidelines.
- 3.3 Perform Basic Life Support procedures.
- 3.4 Demonstrate proper aseptic techniques.
- 3.5 Demonstrate the Pharmacy Assistant's role in contamination control and emergency situations.
- 3.6 Connect drug abuse, addiction, and treatment modalities.
- 3.7 Demonstrate techniques for handling and disposing of hazardous agents.
- 3.8 Identify opportunities for medication errors and explain the effect of medical errors on patient health and safety.

Course Standard 4

HS-POF-4

Summarize the history of government actions within the pharmaceutical industry including pharmacy law, practice, regulations, and standards.

- 4.1 Identify and deliberate legal aspects of administering medications of State and Federal Regulatory Agencies and Acts affecting pharmacy practice, including but not limited to the Controlled Substances Act (CSA), the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), and the Drug Enforcement Administration (DEA).
- 4.2 Review the duties of the Georgia State Board of Pharmacy.
- 4.3 Conceptualize and discuss the components of the Georgia Pharmacy Practice Act that apply to regulate dispensing of drugs.
- 4.4 Categorize the five schedules of controlled substances.
- 4.5 Recall the important details of the Health Insurance Portability and Accountability Act regulations.
- 4.6 Maintain confidentiality of all client/patient information.
- 4.7 Examine the importance of protecting patient privacy in the pharmacy.

Course Standard 5

HS-POF-5

Utilize medical and pharmaceutical terms, abbreviations, symbols, and classifications.

- 5.1 Combine the elements to determine medical and pharmaceutical nomenclature.
- 5.2 Identify and define organ system terminology.
- 5.3 Define and describe different types of diseases and disorders connected with each organ system.
- 5.4 Identify and define abbreviations/symbols associated with drug administration.
- 5.5 Identify the different classifications of drugs and explain the unique properties.
- 5.6 Categorize common drugs by their therapeutic classifications and specify the mechanism of action (MOA), adverse reactions, and other special considerations.
- 5.7 Translate generic and brand names for common medications.

Course Standard 6

HS-POF-6

Interpret parts of a prescription and identify dosage forms, delivery systems and the routes of drug administration.

- 6.1 Locate pharmacy reference sources for: translating a brand name to a generic name; available drug packaging; dosage forms; correct spelling or definition of a medical term/drug; drug costs; locating the National Drug Code number for a drug; correct schedule and/or drug classification.
- 6.2 Differentiate between over-the-counter and legend or prescription drugs.
- 6.3 State the parts of a National Drug Code.
- 6.4 Explicate the uses of drugs as therapeutic, pharmacodynamics, diagnostic, prophylactic, and destructive agents.
- 6.5 Differentiate between therapeutic effects, side effects, an allergic response, and toxic effects and emphasize why the healthcare provider should identify each before administering any medication.
- 6.5 Compare major dosage forms and delivery systems and itemize advantages and disadvantages associated with these terms.
- 6.6 List the major routes of administration and the advantages and disadvantages associated with each dose form.
- 6.7 Identify and describe the factors that can influence the route of administration.

- 6.8 Discuss correct techniques for administration of oral, topical, and parenteral dose forms.
- 6.9 Locate the specific routes of administration (on manikin when necessary) and explain the advantages and disadvantages of each.
- 6.10 Define the terms local use and systemic use, differentiate between systemic and local drug absorption, and explain how these uses are considered when a prescriber selects a drug for a particular patient.

Course Standard 7

HS-POF-7

Formulate, calculate, and demonstrate proper drug doses to prepare medicine for dispensing for patient use.

- 7.1 Identify and explain when math skills may be needed by pharmacy professionals.
- 7.2 Describe four systems of measurement commonly used in pharmacy and convert units from one system to another.
- 7.3 Demonstrate calculations, conversions, and proper articulation of fractions, decimals, and percentages in healthcare operations.
- 7.4 Demonstrate conversions between Roman and Arabic numerals; US Standard time and military time (24 hour clock); Celsius and Fahrenheit.
- 7.5 Calculate percentage of error and evaluate measurements using percentage of error.
- 7.6 Identify ratios that express: a drug's therapeutic index, a solution's strength, and a solution's rate.
- 7.7 Demonstrate computations with proportions including solving for an unknown term in a proportion and converting measurements units using proportions.
- 7.8 Compute correct dosages from doctor orders.
- 7.9 Demonstrate the number of tablets/capsules/or volume of liquid necessary to deliver a prescribed dose.
- 7.10 Reconstitute oral liquids for dispensing into amber bottles.
- 7.11 Calculate parental drug dosages and flow rates when given a supply dosage and a drug order using ratio and proportion equations.
- 7.12 Calculate the correct pediatric dosage based on weight recommendation using proportion and the Body Surface Area (BSA) method from the nomogram.

Course Standard 8

HS-POF-8

Compare and contrast the differences when dealing with pediatric and geriatric pharmacology including administration, dosage, compliance and complications.

- 8.1 Define the basic principles for administering medications for geriatric and pediatric patients.
- 8.2 Specify the effects of nutrition and age-related diseases on therapeutic drug responses.
- 8.3 Explain why the elderly may have problems with drug compliance and polypharmacy and discuss possible solutions.
- 8.4 Investigate special drug considerations involved in administering medications to pediatric patients including the fetal period during pregnancy, the drug exposure during nursing, and the drug interactions/toxicity.

Course Standard 9

HS-POF-9

Perform necessary skills needed to prepare medication for patient use including: prescription processing, packaging, labeling, and dispensing.

- 9.1 Identify and discuss all elements necessary for a complete and legal prescription or medication order.

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- 9.2 Identify and explain the “6 Rights” for processing a prescribed prescription or medication order.
- 9.3 Interpret and transcribe prescription and medication orders.
- 9.4 Demonstrate process for obtaining patient/customer information such as: use of other medications, such as vitamins or nutrients allergies or adverse reactions.
- 9.5 Medical conditions or disabilities reimbursement procedure address, telephone number, date of birth, and other relevant patient/customer information.
- 9.6 Demonstrate process for obtaining patient/customer information from prescriber or other healthcare professions regarding the patient’s diagnosis or desired therapeutic outcome physical disability medication use, Allergies adverse reactions medical history other relevant patient information.
- 9.7 Update patient/customer profile to reflect any changes in medical history, such as increase or decrease in drug dosage, drug interactions, or allergies.
- 9.8 Assess prescriptions and medication orders for authenticity and completeness.
- 9.9 Calculate and enter prescription or medication order information into the system.
- 9.10 Measure, Count, and Calculate medications for dispensing.
- 9.11 Demonstrate different types of drug packaging (single dose, multiple dose, aerosols/ sprays, etc.) and placement in dispensing systems (automated and unit dose).
- 9.12 Identify the required elements of a prescription label and choose the correct auxiliary label.
- 9.13 Demonstrate appropriate verification procedures of the completed measurements, preparation, and/or packaging of medications.
- 9.14 Demonstrate delivery of medication to patient-care unit, nursing station stock, crash carts, and document distribution of prescription medication and controlled substances.
- 9.15 Discuss specific Georgia Pharmacy Laws regarding receiving or placing calls to a physician authorizing prescriptions and/or prescription refills in the community and hospital setting and discuss the role of the Pharmacy assistant.

Course Standard 10

HS-POF-10

Calculate and demonstrate through simulation proper IV set up and simulated administration.

- 10.1 Identify and simulate the correct protocol for administration of I.V. fluids and medications.
- 10.2 Convert milliliters per hour to a flow rate expressed in drops per minute.
- 10.3 Calculate IV fluid rates, total infusion amounts, and IV fluid intake for 24 hours.
- 10.4 Demonstrate appropriate technique for regulating an IV fluid rate manually and per pump programming.
- 10.5 Simulate proper technique for flushing a heparin lock.

Course Standard 11

HS-POF-11

Calculate and demonstrate proper compounding techniques and measurements through simulation.

- 11.1 Research extemporaneous compounding and describe common situations in which compounding is necessary.
- 11.2 Evaluate the equipment used for weighing, measuring and compounding of pharmaceuticals.
- 11.3 Demonstrate proper techniques for weighing pharmaceutical ingredients and measuring liquid volumes.

- 11.4 Prepare solutions, suspensions, ointments, creams, powders, suppositories, and capsules and demonstrate the methods used for compounding and blending of pharmaceutical ingredients.

Course Standard 12

HS-POF-12

Demonstrate appropriate documentation, reports, billing procedures, and other office skills that may be utilized in a pharmacy.

- 12.1 Demonstrate the use of both manual and computer-based information systems to perform job-related activities including generate prescription labels, update supply codes, and produce reports.
- 12.2 Coordinate written, electronic, and oral communications throughout the pharmacy practice setting.
- 12.3 Identify and describe types of prescription program sponsors including Medicaid, Medicare, HMO, and PPO.
- 12.4 Explain third-party billing procedures and transactions including co-pays, deductibles, rejected claims, and prior authorizations.
- 12.5 Demonstrate the process of sales transactions.
- 12.6 Collect productivity information as directed by the pharmacist.
- 12.7 Demonstrate basic office skills including filing chronologically, maintaining accurate logs, and composing letters and memos.
- 12.8 Define necessary disciplinary actions that may be utilized by the employer.

Course Standard 13

HS-POF-13

Demonstrate necessary education of patients/caregivers to promote health and wellness and to prevent problems including patient non-compliance, drug interactions, and abuse and addiction.

- 13.1 Analyze society's focus on health and wellness vs. treatment of disease signs and symptoms and the impact on the provision of pharmacy care.
- 13.2 Explain adverse interactions that may occur through combining vitamins, minerals, nutrients, over-the-counter (OTC) drugs, and prescription drugs.
- 13.3 Hypothesize why patients/customers may not communicate to the pharmacist about poly-pharmacy or non-prescription medications that they are taking and the possible ramifications of their lack of communication.
- 13.4 Identify why a patient/client may be non-compliant with his/her medication regime.
- 13.5 Educate the client/patient regarding potential abuse and addiction of certain therapeutic classes of medications.
- 13.6 Provide supplemental drug/nutrient/product education information to patient/advocate/family.