

**Health Science Career Cluster
Clinical Lab I
Course Number: 25.57600**

Course Description:

The goal of this course is to provide fundamental clinical laboratory assistant skills and knowledge that includes the use of laboratory equipment, safety in the lab, quality control and quality assurance, chemistry, and microbiology. Students will have the opportunity to explore careers in the clinical lab industry and the education required at each level.

The ultimate goal of the Clinical Lab pathway is to prepare students to continue their education at a post-secondary institution, and/or take the external medical lab assistant assessment resulting in an industry credential. In order to be eligible to take the assessment, a student must successfully complete Introduction to Healthcare Science, Essentials of Healthcare, Clinical Lab I, and Clinical Lab II, and any other required clinical experiences mandated by the certifying body. State laws and certifying agency regulations govern which tests can be performed by a clinical lab assistant in each state. Even though certain topics are covered on the national assessment, it should be understood that Lab Assistants must follow Georgia State regulations concerning laboratory testing, and simulation of those components may be required in a classroom setting.

The prerequisites for this course include Introduction to Healthcare Science, Essentials of Healthcare, and Clinical Lab I.

Course Standard 1

HS-CLI-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
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

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				Getting Others to Listen
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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
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

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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
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-CLI-2

Explore options in the Clinical Lab Industry, including medical lab assistant and the organizational structure.

- 2.1 Identify current employment options in the clinical lab profession, and the necessary education and training required.
- 2.2 Differentiate between state and federal licensure laws.
- 2.3 Identify members of the clinical lab team; differentiate between roles, department and responsibilities of team members, and place all members in appropriate positions on the organizational chart.

Course Standard 3

HS-CLI-3

Abide by regulations governing workplace safety, infection control, operational standards, patient confidentiality, and facility protocol.

- 3.1 Demonstrate adhering to regulations regarding workplace safety (e.g., OSHA, NIOSH).
- 3.2 Demonstrate abiding by regulations regarding operational standards (e.g., JCAHO, CLSI).
- 3.3 Demonstrate an understanding of patient privacy (protected health information), as outlined in HIPAA (Health Insurance Portability and Accountability Act) regulations.
- 3.4 Demonstrate accessing SDS (safety data sheets) when chemicals are being used.
- 3.5 Demonstrate following exposure control plans in the event of occupational exposure.
- 3.6 Demonstrate exhibiting appropriate infection control standards and safety equipment, to include biohazards set forth by OSHA and CDC.
- 3.7 Implement infection control procedures to break the chain of infection; transmission via direct and indirect contact, droplets, airborne, and hospital acquired infections.
- 3.8 Demonstrate initiating first aid and Basic Life Support techniques when necessary.
- 3.9 Demonstrate showing the appropriate use of PPE (personal protective equipment) and effective hand sanitization procedures.
- 3.10 Demonstrate reacting to emergency situations following agency procedures and facility protocol.

Course Standard 4

HS-CLI-4

Maintain quality control measures within the medical/lab facility to prevent medical errors and provide appropriate patient care.

- 4.1 Compare quality assurance and quality control.
- 4.2 Identify and describe the national regulatory agencies for quality assurance and healthcare, including JC (Joint Commission), CLIA (Clinical Laboratory Improvement Act), CAP (College of American Pathologists), NAACLS (National Accrediting Agency for Clinical Laboratory Sciences), and CLSI (Clinical and Laboratory Standards Institute).

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- 4.3 Describe quality assurance program components and quality control related to medical lab.
- 4.4 Recognize quality control measurements, including risk management, and demonstrate methods of performance improvement.
- 4.5 Perform outcome measurements through the collection of data to improve quality processes.
- 4.6 Demonstrate the usage of information management components, including bar code systems and documentation in the electronic health records.
- 4.7 Design a basic sample analysis flow chart for routine lab testing.
- 4.8 Demonstrate adhering to regulations regarding confidentiality and appropriate record release.

Course Standard 5

HS-CLI-5

Utilize appropriate laboratory and medical terminology, medical lab equipment and apply the use of the metric system.

- 5.1 Demonstrate the appropriate use of clinical lab nomenclature to include medical terminology related to clinical lab testing and requisitions.
- 5.2 Demonstrate the basic use and maintenance of the following instruments, including microscope, centrifuge, spectrophotometer, and balances.
- 5.3 Demonstrate using appropriate units of measurement.
- 5.4 Demonstrate measuring volume using appropriate glassware and pipettes.
- 5.5 Demonstrate accurate pipetting technique.
- 5.6 Perform math calculations for metric system conversions, temperature conversions, simple dilutions, total magnification, and Beer's Law.

Course Standard 6

HS-CLI-6

Discuss and evaluate clinical techniques in the identification of microbes in a simulated classroom setting.

- 6.1 Demonstrate using aseptic technique in accordance with EPA (Environmental Protection Agency) GLPS (good laboratory practice standards).
- 6.2 Describe appropriate sterilization procedures.
- 6.3 Demonstrate executing routine sterile plating and streaking techniques.
- 6.4 Characterize and classify microorganisms.
- 6.5 Identify and describe morphological characteristics and the factors affecting the growth, survival, and death of microorganisms.
- 6.6 Demonstrate performing a Gram stain and differentiate between gram negative and gram positive.
- 6.7 Demonstrate performing isolation and incubation techniques.
- 6.8 Differentiate types of culture media and their appropriate use including: blood agar, SSA agar, chocolate agar, Thayer-Martin chocolate agar, eosin methylene blue (EMB), thioglycollate broth, and MacConkey agar.
- 6.9 Explain the purpose and process for basic antibiotic resistance.
- 6.10 Identify and describe isolates as pathogens or non-pathogens based on specimen sources.
- 6.11 Describe the proper collection and transportation of specimens for culture and proper handling and disposal of biohazardous materials.

- 6.12 Explain basic concepts of parasitology and mycology, along with symptoms.
- 6.13 Demonstrate utilizing terminology related to bacteriology, including bacteria, aerobic, pathogenic, and anaerobic.
- 6.14 Observe special tests; including Group A streptococci, rapid enzyme immunoassay test (or other antigen detection kits) from throat swabs, and collection of cultures for beta hemolysis screening.

Course Standard 7

HS-CLI-7

Discuss and evaluate basic clinical chemistry techniques in a simulated classroom lab setting.

- 7.1 Calculate normal and molar solutions and dilutions and explain serial dilutions, to determine concentrations of unknowns.
- 7.2 Determine pH and identify examples of different substances and how they relate to buffered systems.
- 7.3 Demonstrate testing specific gravity and interpreting results.
- 7.4 Evaluate pCO₂ and pO₂ concentration and balance as it relates to the human body.
- 7.5 Explain basic concepts of titration and titration curves.
- 7.6 Identify routine chemical tests to include electrolyte, liver, and cardiac panels, and relate normal and abnormal values to disease states.
- 7.7 Explain the use of a spectrophotometer.
- 7.8 Perform Point of Care Testing (POCT) on waived tests, such as cholesterol and hemoglobin.
- 7.9 Demonstrate utilizing general terminology related to clinical chemistry, including liver function testing, carbohydrate metabolism testing, thyroid testing, kidney function testing, and electrolytes.
- 7.10 Collect and handle blood specimens for analysis taking precautions to prevent hemolysis and anticoagulant usage.
- 7.11 Handle, process, and preserve body fluids for chemical analysis.
- 7.12 Demonstrate performing maintenance on POCT analyzers.
- 7.13 Identify automated instrumentation, including the operation and principles of commonly-used special analyzers.
- 7.14 Demonstrate performing POCT tests for glucose and know true glucose tests (glucose-specific).
- 7.15 Explain testing for blood urea nitrogen (BUN) and tests for creatinine.
- 7.16 Identify and explain the procedures for point-of-care testing.

Course Standard 8

HS-CLI-8

Ensure proper specimen collection and test management.

- 8.1 Demonstrate performing proper blood film preparation.
- 8.2 Demonstrate collecting and handling specimens while adhering to time and temperature requirements.
- 8.3 Demonstrate processing specimens for shipping.
- 8.4 Demonstrate instructing patient in the collection of specimens.

Course Standard 9

HS-CLI-9

Maintain appropriate reports and patient data, inventory and supplies, and billing procedures for laboratory tests.

- 9.1 Demonstrate utilizing electronic health records for the reporting and documentation of patient collection data and lab results.
- 9.2 Identify and explain the components of a complete and final report.
- 9.3 Demonstrate maintaining inventory levels, orders, and restocking of supplies.
- 9.4 Demonstrate utilizing electronic billing software.

Course Standard 10

HS-CLI-10

Discuss proper communication techniques with medical personnel, patients, and families regarding laboratory testing and special requirements for lab tests.

- 10.1 Demonstrate communicating with physician offices and hospital patient units regarding special scheduling and special situations.
- 10.2 Demonstrate informing and explaining special test requirements to patients and/or family members.