



Horry-Georgetown
Technical College

COURSE INSTRUCTIONAL PACKAGE

MLT 131
Clinical Chemistry

Effective Term
Fall 2026

Part I: Course Information

Effective Term: Fall 2026

COURSE PREFIX: MLT 131

COURSE TITLE: Clinical Chemistry

CONTACT HOURS: 3-hour CREDIT HOURS: 3 hours

RATIONALE FOR THE COURSE:

This course focuses on the study of nutritional, functional and excretional chemicals in blood and body fluids, including testing techniques and clinical significance.

COURSE DESCRIPTION:

This course provides a study of the chemical elements in human blood and body fluids and their relationship to organ system function. Testing methods, interferences, quality control and clinical correlations will be emphasized.

PREREQUISITES/CO-REQUISITES:

Pre-Req ENG 101, MAT 120, CHM 105 or CHM 110, BIO 112 or higher; Co-Req MLT 102, MLT 105, MLT 115.

REQUIRED MATERIALS:

Please visit the [BOOKSTORE](#) online site for most current textbook information.

Enter the semester, course prefix, number and section when prompted and you will be linked to the correct textbook.

ADDITIONAL REQUIREMENTS:

Additional items will be provided for your lab class.

TECHNICAL REQUIREMENTS:

Access to Desire2Learn (D2L), HGTC's learning management system (LMS) used for course materials.

Access to myHGTC portal for student self-services.

College email access – this is the college's primary official form of communication.

ATTENDANCE VERIFICATION:

The Add/Drop Period is the first 7 days of the semester for **full term** classes. Add/Drop periods are shorter for accelerated format classes. Please refer to the [academic calendar](#) for deadlines for add/drop. You must attend at least one meeting of all your classes during that period. If you do not, you will be dropped from the course(s) and your Financial Aid will be reduced accordingly

STUDENT COURSE EVALUATIONS:

Each semester, students are provided with an opportunity to participate in course evaluation surveys. These evaluations offer crucial feedback to instructors and the College, leading to enhancement of educational quality. By completing these surveys, you play a key role in the ongoing improvement of teaching methods and course content, ensuring future students enjoy a better learning experience. Students are encouraged to complete these surveys as your active participation in this process reflects your dedication to your education and drives positive change.

CLASSROOM ETIQUETTE AND STUDENT RIGHTS AND RESPONSIBILITIES:

As a matter of courtesy to other students and your professor, please turn off cell phones and other communication/entertainment devices before class begins. If you are monitoring an emergency, please notify your professor prior to class and switch cell phone ringers to vibrate.

To ensure a positive College experience, guidelines exist in numerous areas of campus life. The Student Code for The South Carolina Technical College System "The Student Code" (3-2-106.1) applies to all HGTC students. The Student Code sets forth rights and responsibilities of the individual student, identifies behaviors that are not consistent with the values of college communities, and describes the procedures that will be followed to adjudicate cases of alleged misconduct. Students are expected to conduct themselves in a civil manner, that is respectful of the rights of others, and that is compatible with the college's educational mission. Students are expected to comply with all of the college's duly established rules and regulations regarding student behavior while on campus; while participating in off-campus college sponsored activities; and while participating in off-campus clinical, field, internship, or in-service experiences. Students are expected to comply with all course requirements as specified by instructors in

course syllabi and to meet the standards of acceptable classroom behavior set by instructors. For more information, login to your myHGTC account under "Student Rights and Responsibilities" card then select "Student Code of Conduct" or the "Student Catalog and Handbook."

Part II: Student Learning Outcomes

COURSE LEARNING OUTCOMES and ASSESSMENTS*:

1. Compare and contrast the types of glassware and plasticware.
2. Explain mathematic formulas utilized in Clinical Chemistry.
3. Categorize examples of preanalytical, analytical and post analytical parts of the Clinical Chemistry testing process.
4. Explain Quality Control and Quality Assurance policies.
5. Describe the relationships among wavelength, frequency, energy, and color of the ultraviolet and visible spectra. Discuss the goals of automating clinical chemistry tests.
6. Describe the four levels of an enzyme.
7. Describe the role laboratory tests play in confirming or ruling out a diagnosis.
8. Discuss laboratory findings in compensated respiratory acidosis and alkalosis and in metabolic acidosis and alkalosis.

Week 1

Materials Covered: Clinical Chemistry: Fundamentals and Laboratory Techniques, Larson
Chapter 1

1. Describe the types of centrifuges used in the laboratory.
2. Compare and contrast the types of glassware and plasticware.
3. Define molality and perform the calculations needed for preparing and working with molal solutions.
4. Define normality, equivalent weight, and milliequivalent weight and perform the calculations needed for preparing and working with normal solutions.
5. Define g/dL and mg/dL units and perform calculations necessary to prepare solutions of a desired g/dL and mg/dL concentration.
6. Define terms used in Clinical Chemistry.

Lab:

Materials Covered: Lab handouts

1. Correctly wash hands before wearing.
2. Utilize appropriate Lab PPE.
3. Use general safety equipment correctly.

4. Disposed of biohazardous material in the clinical laboratory.

Week 2

Materials Covered: Clinical Chemistry: Fundamentals and Laboratory Techniques, Larson
Chapter 1 Continued – Lab math

Lab:

Materials Covered: Lab handouts

1. Correctly weigh substances on an electronic analytical balance.
2. Correctly prepare solution concentrations.
3. Demonstrate technique for quantitative transfer of liquids.
4. Discuss Instrument QC and Calibrations

Week 3

Materials Covered: Clinical Chemistry: Fundamentals and Laboratory Techniques, Larson
Chapter 3

1. Describe the properties of Light.
2. Describe the principle of each of the following methodologies:
 - a. Spectrophotometry
 - b. Fluorometry
 - c. Luminometry
 - d. Nephelometry and Turbidimetry
 - e. Electrochemistry and Chemical Sensors
 - f. Chromatography
 - g. Mass Spectrometry

Lab:

Materials Covered: Pointe 180 Analyzer Procedure Manual

1. Discuss the Pointe 180 analyzer set instructions.
2. Perform calibration on the Pointe 180 Chemistry Analyzer.
3. Provide appropriate feedback during interventions to your lab partner to achieve the desired outcomes.

Week 4

Materials Covered: Clinical Chemistry: Fundamentals and Laboratory Techniques, Larson
Chapter 3- Continued

Lab:

Materials Covered: Pointe 180 Analyzer Procedure Manual

1. Discuss Spectrometry use in the clinical laboratory.

Week 5

Materials Covered: Clinical Chemistry: Fundamentals and Laboratory Techniques, Larson
Chapter 7

1. Discuss the purpose of preventive maintenance.
2. Discuss the purpose of service contracts.
3. Discuss pieces of QA in the chemistry lab.
4. Discuss the purpose of quality control and troubleshooting.
5. Describe how purchasing and inventory contribute to the laboratory's QMS.

Lab:

Materials Covered: Pointe 180 Analyzer Procedure Manual

1. Perform specimen testing on the Pointe 180 Chemistry Analyzer.
2. Follows the directions accurately.
3. Recognize when test results are falsely positive or falsely neg.
4. Interpret test results as to what the results mean for the patient.
5. Identify potential sources of error of the test.
6. Resolve discrepancies.
7. Provide justification for the ordering of the test.

Week 6

Chapter 8

1. Describe the four levels of an enzyme.
2. Describe why enzyme reactions do not require standards or use a standard curve to determine concentrations of unknowns.
3. Explain the correlation of tests results to the patient clinical presentation and diagnosis.

Lab:

Materials Covered: Pointe 180 Analyzer Procedure Manual

1. Perform specimen testing on the Pointe 180 Chemistry Analyzer.
2. Follows the directions accurately.
3. Recognize when test results are falsely positive or falsely neg.
4. Interpret test results as to what the results mean for the patient.
5. Identify potential sources of error of the test.
6. Resolve discrepancies.
7. Provide justification for the ordering of the test.

Week 7

Materials Covered: Clinical Chemistry: Fundamentals and Laboratory Techniques, Larson

Chapter 15

1. Identify the 20 common amino acids.
2. Describe a peptide bond.
3. Compare and contrast the four levels of structure of a protein.

Lab:

Materials Covered: Pointe 180 Analyzer Procedure Manual

1. Perform specimen testing on the Pointe 180 Chemistry Analyzer.
2. Follows the directions accurately.
3. Recognize when test results are falsely positive or falsely neg.
4. Interpret test results as to what the results mean for the patient.
5. Identify potential sources of error of the test.
6. Resolve discrepancies.
7. Provide justification for the ordering of the test.

Week 8

Materials Covered: Clinical Chemistry: Fundamentals and Laboratory Techniques, Larson

Chapter 13 Blood Gases and Acid-Base Balance

1. Describe the purpose of measuring blood gases and pH.
2. Describe how gases are exchanged in the body.
3. Explain the correlation of tests results to the patient clinical presentation and diagnosis.
4. Interpret the interrelation between pCO₂, pH, and HCO₃⁻.

Lab:

Materials Covered: Pointe 180 Analyzer Procedure Manual

1. Perform specimen testing on the Pointe 180 Chemistry Analyzer.
2. Follows the directions accurately.
3. Recognize when test results are falsely positive or falsely neg.
4. Interpret test results as to what the results mean for the patient.
5. Identify potential sources of error of the test.

6. Resolve discrepancies.
7. Provide justification for the ordering of the test.

Week 9

Materials Covered: Clinical Chemistry: Fundamentals and Laboratory Techniques, Larson
Chapter 19

1. Identify the main structures in the respiratory tract.
2. Illustrate gas exchange in the lungs.
3. Discuss respiratory diseases and lab test results.
4. Compare and contrast breathing and respiration.
5. State the reference ranges for pH and for the partial pressures of carbon dioxide (pCO₂) and oxygen (pO₂).

Lab:

Materials Covered: Pointe 180 Analyzer Procedure Manual

1. Perform specimen testing on the Pointe 180 Chemistry Analyzer.
2. Follows the directions accurately.
3. Recognize when test results are falsely positive or falsely neg.
4. Interpret test results as to what the results mean for the patient.
5. Identify potential sources of error of the test.
6. Resolve discrepancies.
7. Provide justification for the ordering of the test.

Week 10

Materials Covered: Clinical Chemistry: Fundamentals and Laboratory Techniques, Larson
Chapter 16

1. Define the terms cancer, benign, and malignant.
2. Describe the classifications of tumors.
3. Explain the correlation of tests results to the patient clinical presentation and diagnosis.
4. Describe the mechanisms that produce cancer.
5. Describe metastases and the types of cancers that most frequently produce them.
6. Describe the grading and staging systems for cancerous tumors.

Lab:

Materials Covered: Pointe 180 Analyzer Procedure Manual

1. Perform specimen testing on the Pointe 180 Chemistry Analyzer.
2. Follows the directions accurately.
3. Recognize when test results are falsely positive or falsely neg.
4. Interpret test results as to what the results mean for the patient.
5. Identify potential sources of error of the test.
6. Resolve discrepancies.
7. Provide justification for the ordering of the test.

Week 11

Materials Covered: Clinical Chemistry: Fundamentals and Laboratory Techniques, Larson

Chapter 17

1. Describe how fatty acids are broken down.
2. Evaluate the role of fatty acids in ketone formation.
3. Describe the structure of triglycerides and their importance.
4. Explain the correlation of tests results to the patient clinical presentation and diagnosis.
5. Describe the function of phospholipids, sterols, sphingolipids, and cholesterol.
6. Compare and contrast the structure, function, and importance of chylomicrons, VLDL, LDL, IDL, and HDL.

Lab:

Materials Covered: Pointe 180 Analyzer Procedure Manual

1. Perform specimen testing on the Pointe 180 Chemistry Analyzer.
2. Follows the directions accurately.
3. Recognize when test results are falsely positive or falsely neg.
4. Interpret test results as to what the results mean for the patient.
5. Identify potential sources of error of the test.
6. Resolve discrepancies.
7. Provide justification for the ordering of the test.

Week 12

Materials Covered: Clinical Chemistry: Fundamentals and Laboratory Techniques, Larson

Chapter 18

2026-2027

1. Define myocardial infarction and list the contributing factors.
2. Compare and contrast blood tests and other tests used for detection of myocardial infarction.
3. Describe the disease processes associated with congestive heart failure.
4. Discuss and evaluate the tests used to diagnose congestive heart failure.

Lab:

Materials Covered: Pointe 180 Analyzer Procedure Manual

1. Perform specimen testing on the Pointe 180 Chemistry Analyzer.
2. Follows the directions accurately.
3. Recognize when test results are falsely positive or falsely neg.
4. Interpret test results as to what the results mean for the patient.
5. Identify potential sources of error of the test.
6. Resolve discrepancies.
7. Provide justification for the ordering of the test.

Week 13

Materials Covered: Clinical Chemistry: Fundamentals and Laboratory Techniques, Larson
Chapter 20

1. Identify the primary and secondary organs of the gastrointestinal system.
2. Explain the correlation of tests results to the patient clinical presentation and diagnosis.
3. Describe the digestive process.
4. Explain the physiology of the gastrointestinal system, including carbohydrate digestion, protein digestion, and lipid digestion.
5. Compare the various tests for identifying Helicobacter pylori infection and how H. pylori infection is associated with gastric and duodenal ulcers.

Lab:

Materials Covered: Pointe 180 Analyzer Procedure Manual

1. Perform specimen testing on the Pointe 180 Chemistry Analyzer.
2. Follows the directions accurately.
3. Recognize when test results are falsely positive or falsely neg.

4. Interpret test results as to what the results mean for the patient.
5. Identify potential sources of error of the test.
6. Resolve discrepancies.
7. Provide justification for the ordering of the test.

Week 14

Materials Covered: Clinical Chemistry: Fundamentals and Laboratory Techniques, Larson
Chapter 21

1. List the anatomy of the liver and the biliary system.
2. Discuss the liver's role in the metabolism of carbohydrates, proteins, and lipids.
3. Explain the liver's role in the excretion of metabolic products such as ammonia and urea.
4. Explain the correlation of test results to the patient clinical presentation and diagnosis.
5. Discuss the major functions of the liver including synthesis of proteins, bile, and coagulation factors; detoxification and metabolism of porphyrins; and storage of various compounds.

Lab:

Lab Comprehensive Competency.

Week 15

Materials Covered: Clinical Chemistry: Fundamentals and Laboratory Techniques, Larson
Final Exam Review

****Students – please refer to the Instructor's Course Information sheet for specific information on assessments and due dates.***

Part III: Grading and Assessment

EVALUATION OF REQUIRED COURSE MEASURES/ARTIFACTS*:

Students' performance will be assessed, and the weight associated with the various measures/artifacts are listed below.

EVALUATION*

Chapter Tests	50%
Lab Assignments	20%
Lab Comprehensive Evaluation	50%
Lab skills competencies	25%
Weekly Affective Skills	25%
Homework Assignments	5%
In class quizzes	5%
Final Exam	<u>20%</u>
	100%

****Students, for the specific number and type of evaluations, please refer to the Instructor's Course Information Sheet.***

GRADING SYSTEM:

Please note the College adheres to a 10-point grading scale A = 100 – 90, B = 89–80, C = 79 – 70, D = 69 – 60, F = 59 and below.

Grades earned in courses impact academic progression and financial aid status. Before withdrawing from a course, be sure to talk with your instructor and financial aid counselor about the implications of that course of action. Ds, Fs, Ws, and Is also negatively impact academic progression and financial aid status.

Part IV: Attendance

Horry-Georgetown Technical College maintains a general attendance policy requiring students to be present for a minimum of 80 percent (80%) of their classes to receive credit for any course. Due to the varied nature of courses taught at the college, some faculty may require up to 90 percent (90%) attendance. Pursuant to 34 Code of Federal Regulations 228.22 – Return to Title IV Funds, once a

student has missed over 20% of the course or has missed two (2) consecutive weeks, the faculty is obligated to withdraw the student, and a student may not be permitted to reenroll. **Instructors define absentee limits for their class at the beginning of each term; please refer to the Instructor Course Information Sheet.**

Part V: Student Resources



THE STUDENT SUCCESS AND TUTORING CENTER (SSTC):

The SSTC offers all students the following **free** resources:

1. Academic tutors for most subject areas, Writing Center support, and Academic Coaching for college success skills.
2. Online tutoring and academic support resources.
3. Professional and interpersonal communication coaching.

Visit the [Student Success & Tutoring Center](#) website for more information. To schedule tutoring or coaching, contact the SSTC at sstc@hgtc.edu or self-schedule in the Penji iOS/Android app or at www.penjiapp.com. Email sstc@hgtc.edu or call SSTC Conway, 349-7872; SSTC Grand Strand, 477-2113; and SSTC Georgetown, 520-1455, or go to the SSTC [Online Resource Center](#) to access on-demand resources.

STUDENT INFORMATION CENTER – TECH Central:



TECH Central offers all students the following **free** resources:

1. Getting around HGTC: General information and guidance for enrollment, financial aid, registration, and payment plan support!
2. In-person and remote assistance are available for Desire2Learn, Student Portal, Degree Works, and Office 365.
3. Chat with our staff on TECH Talk, our live chat service. TECH Talk can be accessed on the student portal and on TECH Central's website, or by texting questions to (843) 375-8552. Visit the [Tech Central website](#) for more information. Live Chat and Center locations are posted on the website. You may also call (843) 349-5199.

HGTC LIBRARY:

Each campus location has a library where HGTC students, facul



check out materials with their HGTC ID. All three HGTC campus libraries have librarians and staff who can aid with research, computers to support academic research and related school-work, and individual/group study rooms. Printing is available as well at each location. Visit the [Library](#) website for more information or call (843) 349-5268.

STUDENT TESTING:

Testing in HGTC courses may occur during regularly scheduled class time or online, with or without proctoring. Tests may be delivered in the following formats:

- Digitally through D2L
- In writing on paper
- Through a publisher platform (note: some publisher platforms carry an associated fee)

Tests may include time limits and may require proctoring depending on the course.

When proctoring is required and is not provided by the course instructor in the classroom, students may complete their test face-to-face at an [HGTC Testing Center](#) or another approved testing site, or online using HGTC's online proctoring provider. For more information about available proctoring options, visit the [Online Testing](#) section of the HGTC Testing Center webpage.

Students testing at an HGTC Testing Center should note the following:

- **Appointments must be scheduled at least 24 hours in advance.**
- **A physical, government-issued photo ID is required to test.**

The **Instructor Information Sheet** will have more details on test requirements for your course.

DISABILITY SERVICES:

HGTC is committed to providing an accessible environment for students with disabilities. Students seeking accommodations are encouraged to visit HGTC's [Accessibility and Disability Service webpage](#) for detailed information.

It is the student's responsibility to self-identify as needing accommodations and to provide appropriate documentation. Once documentation is submitted, the student will participate in an interactive process with Accessibility and Disability Services staff to determine reasonable accommodations. Students may begin the accommodations process at any time; however, accommodations are **not retroactive** and will only be applied from the point at which they are approved. Students must contact the office **each semester** to renew their accommodations.

For assistance, please contact the Accessibility and Disability Services team at disabilityservices@hgtc.edu or 843-796-8818 (call or text).

COUNSELING SERVICES:

HGTC Counseling Services strives to optimize student success through managing personal and academic concerns that may interfere with achieving educational goals. Staff are available to every student for assistance and guidance on personal matters, academic concerns and other areas of concern. HGTC offers free in-person and telehealth counseling services to students. For more information about counseling services, please reach out to counseling@hgtc.edu or visit the website the [Counseling Services webpage](#).

STATEMENT OF EQUAL OPPORTUNITY/NON-DISCRIMINATION STATEMENT:

Our sincere commitment to both effective business management and equitable treatment of our employees requires that we present this Policy Statement as an embodiment of that commitment to the fullest.

Discrimination is conduct that includes unjust or prejudicial treatment based upon an individual's age, race, color, sex, religion, national origin, disability, and genetic information or any other protected classes deemed unlawful under State or Federal law that excludes an individual from participation in, denies the individual the benefits of, treats the individual differently, or otherwise adversely affects a term or condition of a person's working or learning environment. This includes failing to provide reasonable accommodation, consistent with state and federal law, to persons with disabilities.

All inquiries regarding the federal laws as they relate to discrimination on the basis of sex may be directed to Jen Riddei, Title IX Coordinator, Horry-Georgetown

Technical College, Building 1100C, Room 107B, 2050 HWY 501 E, PO Box 261966, 843-349-5218, Jenifer.Riddei@hgtc.edu.

Student and prospective student inquiries concerning the federal laws and their application to the College or any student decision may be directed to Dr. Melissa Batten, Vice President, Student Affairs, and Section 504 & Title II Coordinator, Horry-Georgetown Technical College, Building 1100C, Room 107A, 2050 HWY 501 E, PO Box 261966-6066, 843-349-5228, Melissa.Batten@hgtc.edu.

Employee and applicant inquiries concerning the federal laws and their application to the College may be directed to Jacquelyne Synder, Vice President, Human Resources and Employee Relations and the College's Affirmative Action/Equal Opportunity Officer, Horry-Georgetown Technical College, Building 200C, Room 205B, 2050 HWY 501 E, PO Box 261966, Conway, SC 29528-6066, 843-349-5212, Jacquelyne.Snyder@hgtc.edu.

TITLE IX REQUIREMENTS:

Title IX of the Education Amendments of 1972 protects students, employees, applicants for admission and employment, and other persons from all forms of sex discrimination.

HGTC prohibits the offenses of sexual harassment, domestic violence, dating violence, sexual assault, and stalking and will provide students, faculty, and staff with necessary information regarding prevention, policies, procedures, and resources.

Any student, or other member of the college community, who believes that they have been a victim of sexual harassment, domestic violence, dating violence, sexual assault, or stalking may file a report with the college's Title IX Coordinator or campus law enforcement*.

*Faculty and Staff are required to report these incidents to the Title IX Coordinator when involving students. The only HGTC employees exempt from mandatory reporting are licensed mental health professionals (only as part of their job description such as counseling services).

All inquiries regarding the federal laws as they relate to discrimination on the basis of sex may be directed to Jen Riddei, Title IX Coordinator, Horry-Georgetown Technical College, Building 1100C, Room 107B, 2050 HWY 501 E, PO Box 261966, 843-349-5218, Jenifer.Riddei@hgtc.edu.

PREGNANCY ACCOMMODATIONS

Under Title IX, colleges must not exclude a pregnant student from participating in any part of an educational program. Horry-Georgetown Technical College is committed to ensuring that pregnant students receive reasonable accommodations to ensure access to our educational programs.

Students should advise the Title IX Coordinator of a potential need for accommodations as soon as they know they are pregnant. It is extremely important that communication between student, instructors, and the Title IX Coordinator begin as soon as possible. Each situation is unique and will be addressed individually.

Title IX accommodations DO NOT apply to Financial Aid. Financial Aid regulations do not give the College any discretion in terms of Financial Aid eligibility.

Certain educational programs may have strict certification requirements or requirements mandated by outside regulatory agencies. Therefore, in some programs, the application of Title IX accommodations may be limited.

To request pregnancy accommodations, please complete the *Pregnancy Intake Form* that can be found [here](#).