



**CLINICAL LABORATORY TECHNOLOGY
CLBT 1070 CLINICAL CHEMISTRY
COURSE SYLLABUS
SPRING SEMESTER 2018**

INSTRUCTOR CONTACT INFORMATION

Cynthia Williams, MS, MT (AMT) (HHS)

Office Hours: 7:30-8 am; 3:30-5 pm

Office Location: 716 Gillis Building

Email Address: [Cynthia Williams](mailto:Cynthia.Williams@southeasterntech.edu) (cwilliams@southeasterntech.edu)

Phone: 912-538-3183

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COURSE INFORMATION

Credit Hours/Minutes: 4/6000

Class Location: Room 739 Gillis Building

Class Meets: Monday, Tuesday, Wednesday, 12:30pm-3:15pm

Course Reference Number (CRN): 40211

SOUTHEASTERN TECHNICAL COLLEGE'S (STC) CATALOG AND HANDBOOK

Students are responsible for all policies and procedures and all other information included in Southeastern Technical College's [Catalog and Handbook](http://www.southeasterntech.edu/student-affairs/catalog-handbook.php) (<http://www.southeasterntech.edu/student-affairs/catalog-handbook.php>).

REQUIRED TEXT

Clinical Chemistry, Principles, Procedures, Correlations, 6th Edition, Bishop, Michael L. et al. Lippincott Williams & Wilkins Publishers

REQUIRED SUPPLIES & SOFTWARE

Ink pens, pencil, highlighter, permanent marker, paper and any other supplies deemed necessary by instructor. Calculator is provided.

COURSE DESCRIPTION

Develops concepts and techniques of clinical chemistry applicable to medical laboratory technology. Topics include: carbohydrates, electrolytes and acid-base balance, nitrogenous compounds, related lab math, enzymes and endocrinology, liver functions, lipids, toxicology and therapeutic drug monitoring, safety and quality control, correlation of disease states, process improvement (team approach), and critical thinking skills.

MAJOR COURSE COMPETENCIES

1. Carbohydrates,
2. Electrolytes and acid-base balance,
3. Nitrogenous compounds,
4. Related lab math

5. Enzymes and endocrinology,
6. Liver functions,
7. Lipids,
8. Toxicology and therapeutic drug monitoring,
9. Safety and quality control,
10. Correlation of disease states,
11. Process improvement (team approach),
12. Critical thinking skills

PREREQUISITE(S)

BIOL 2114, BIOL 2114L, Chem 1151, CLBT 1010

COURSE OUTLINE

Carbohydrates

ORDER	DESCRIPTION	LEARNING DOMAIN	LEVEL OF LEARNING
1	Describe carbohydrate metabolism.	Cognitive	Comprehension
2	Discuss test principles and procedures.	Cognitive	Comprehension
3	Perform selected tests.	Psychomotor	Guided Response

Electrolytes and Acid-Base Balance

ORDER	DESCRIPTION	LEARNING DOMAIN	LEVEL OF LEARNING
1	Describe and discuss electrolyte functions and procedures.	Cognitive	Comprehension
2	Explain acid-base balance.	Cognitive	Comprehension
3	Perform selected tests.	Psychomotor	Guided Response
4	Discuss carbon dioxide (CO ₂) content in the blood.	Cognitive	Comprehension
5	Discuss carbon dioxide (CO ₂) procedures.	Cognitive	Comprehension
6	Discuss the carbonate-bicarbonate buffer system.	Cognitive	Comprehension
7	Discuss blood gases.	Cognitive	Comprehension
8	Interpret arterial blood gasses (ABG) results.	Cognitive	Comprehension
9	Discuss selected mineral (e.g., iron, calcium, phosphorus, and magnesium) physiology.	Cognitive	Comprehension
10	Discuss mineral test principles and procedures.	Cognitive	Comprehension

Nitrogenous Compounds

ORDER	DESCRIPTION	LEARNING DOMAIN	LEVEL OF LEARNING
1	Discuss nitrogenous compound physiology including blood urea nitrogen (BUN), uric acid, proteins, and creatinine/creatine.	Cognitive	Comprehension
2	Discuss concept of clearance tests.	Cognitive	Comprehension
3	Discuss nitrogenous compound selected testing principles and procedures.	Cognitive	Comprehension
4	Interpret electrophoretic patterns.	Cognitive	Comprehension

ORDER	DESCRIPTION	LEARNING DOMAIN	LEVEL OF LEARNING
5	Perform selected tests.	Psychomotor	Guided Response
6	Discuss the critical factors relating to therapeutic drug monitoring (TDM) such as patient blood levels, dosage administered, and specimen collection times.	Cognitive	Comprehension

Related Lab Math

ORDER	DESCRIPTION	LEARNING DOMAIN	LEVEL OF LEARNING
1	Perform related quality control (QC) math calculations--mean, median, mode, standard deviation, coefficient of variation.	Cognitive	Synthesis
2	Perform related math calculations using Beer's law.	Cognitive	Synthesis
3	Perform related math calculations for clearances, dilutions, metric system and preparation of solutions using $V_1C_1 = V_2C_2$.	Cognitive	Synthesis
4	Perform related math calculations for calculation of globulin, (A/G ratio), Ion gap, Blood gases (Henderson Hasselbach), Low density Lipoprotein(LDL)-Cholesterol, LDL: High density lipoprotein (HDL) ratio, Indirect bilirubin, %Creatine kinase (CK)-MB of total CK.	Cognitive	Synthesis

Enzymes and Endocrinology

ORDER	DESCRIPTION	LEARNING DOMAIN	LEVEL OF LEARNING
1	Discuss the physiology of selected enzymes.	Cognitive	Comprehension
2	Relate selected enzymes to tissue locations.	Cognitive	Application
3	Discuss isoenzymes and the clinical implications.	Cognitive	Comprehension
4	Discuss selected test principles and procedures.	Cognitive	Comprehension
5	Interpret electrophoretic patterns.	Cognitive	Comprehension
6	Perform selected tests.	Psychomotor	Guided Response
7	Discuss the physiology of selected hormones.	Cognitive	Comprehension
8	Discuss thyroid functions and testing.	Cognitive	Comprehension
9	Discuss other hormone functions and testing.	Cognitive	Comprehension

Liver Functions

ORDER	DESCRIPTION	LEARNING DOMAIN	LEVEL OF LEARNING
1	Discuss the physiology of the liver.	Cognitive	Comprehension
2	Describe bilirubin metabolism.	Cognitive	Comprehension
3	Discuss selected liver function test principles/procedures.	Cognitive	Comprehension
4	Perform selected tests such as bilirubin and ammonia.	Psychomotor	Guided Response

Lipids

ORDER	DESCRIPTION	LEARNING DOMAIN	LEVEL OF LEARNING
1	Describe the physiology of selected lipids and lipoproteins.	Cognitive	Comprehension
2	Discuss cholesterol, triglyceride, fatty acid, and lipoprotein test principles and procedures.	Cognitive	Comprehension
3	Interpret electrophoretic patterns.	Cognitive	Comprehension
4	Perform selected tests.	Psychomotor	Guided Response

Toxicology and Therapeutic Drug Monitoring

ORDER	DESCRIPTION	LEARNING DOMAIN	LEVEL OF LEARNING
1	Discuss the application of therapeutic drug testing.	Cognitive	Comprehension
2	Discuss critical factors relating to TDM such as patient blood levels, dosage administered, and specimen collection times.	Cognitive	Comprehension
3	Discuss legalities of testing for drugs of abuse (including alcohol).	Cognitive	Comprehension
4	Discuss selected tests for toxic substances.	Cognitive	Comprehension

Safety and Quality Control

ORDER	DESCRIPTION	LEARNING DOMAIN	LEVEL OF LEARNING
1	Implement established safety guidelines when considering biological, chemical, electrical, mechanical, fire, and radiation hazards.	Cognitive	Application
2	Calibrate and operate selected instrumentation.	Cognitive	Application
3	Discuss blood gas instrumentation.	Cognitive	Comprehension
4	Perform selected tests.	Psychomotor	Guided Response
5	Establish standard curve for selected procedure.	Cognitive	Application
6	Set up standard deviation chart for selected lab procedure.	Cognitive	Application
7	Calculate and prepare common laboratory solutions.	Psychomotor	Complex Response
8	Evaluate test procedure using quality control guidelines.	Cognitive	Evaluation
9	Identify and discuss normal/ abnormal/critical values.	Cognitive	Knowledge
10	Correlate abnormal/normal findings with disease states.	Cognitive	Analysis

Correlation of Disease States

ORDER	DESCRIPTION	LEARNING DOMAIN	LEVEL OF LEARNING
1	Evaluate laboratory data and correlate with disease states.	Cognitive	Evaluation

Process Improvement (Team Approach)

ORDER	DESCRIPTION	LEARNING DOMAIN	LEVEL OF LEARNING
1	Discuss current and potential issues in the chemistry lab.	Cognitive	Comprehension

ORDER	DESCRIPTION	LEARNING DOMAIN	LEVEL OF LEARNING
2	Describe methods used to improve performance in the clinical chemistry laboratory using numerical data.	Cognitive	Comprehension

Critical Thinking Skills

ORDER	DESCRIPTION	LEARNING DOMAIN	LEVEL OF LEARNING
1	Evaluate situations determining correct steps to take to troubleshoot the instrument to report reliable results.	Cognitive	Evaluation
2	Evaluate laboratory data to determine which tests are needed and whether the results are reliable.	Cognitive	Evaluation
3	Determine whether results are "critical values".	Cognitive	Application

GENERAL EDUCATION CORE COMPETENCIES

Southeastern Technical College has identified the following general education core competencies that graduates will attain:

1. The ability to utilize standard written English.
2. The ability to solve practical mathematical problems.
3. The ability to read, analyze, and interpret information.

STUDENT REQUIREMENTS

Students are expected to complete all tests, assignments, and Laboratory Reports by the due dates. A ten point penalty will be assessed for each day an assignment or Laboratory Report is late. Students are required to pass all laboratory skills in three attempts. A student may not progress until skills are mastered. Students are responsible for policies, procedures, and requirements (drug screen, background check, immunizations, Fit test, CPR...) included in the STC Catalog/Clinical Laboratory Technology (CLT) handbook. Students are required to read the chapter prior to class. Tests will be timed. Points will be deducted for spelling due to Medical Liability in the work place. Laboratory results are legal documents.

ATTENDANCE GUIDELINES

Class attendance is a very important aspect of a student's success. Being absent from class prevents students from receiving the full benefit of a course and interrupts the learning process. Southeastern Technical College considers both tardiness and leaving early as types of absenteeism. Responsibility for class attendance rests with the student. Regular and punctual attendance at all scheduled classes is required for student success. Students will be expected to complete all work required by the instructor as described in the individual course syllabus.

Instructors have the right to give unannounced quizzes/assignments. Students who miss an unannounced quiz or assignment will receive a grade of 0. Students who stop attending class, but do not formally withdraw, may receive a grade of "F" (Failing 0-59) and face financial aid repercussions in upcoming semesters.

Instructors are responsible for determining whether missed work may be made up and the content and dates for makeup work is at the discretion of the instructor.

Students will not be withdrawn by an instructor for attendance; however, all instructors will keep records of graded assignments and student participation in course activities. The completion dates of these activities will be used to determine a student's last date of attendance in the event a student withdraws, stops attending, or

receives an "F" in a course.

CLT attendance is counted from the first scheduled class meeting of each semester. To receive credit for a course a student must attend at least 90% of the scheduled instructional time. All work missed due to tardiness or absences must be made up at the convenience of the instructor. Any student attending less than the required scheduled instructional time as noted on each syllabus will receive a "W" for the course if removed from the course on or before the 65% portion of the semester (see STC's calendar on our website for the actual date of the 65% point). After the 65% portion of the semester, the student has earned the right to a letter grade and will receive a grade for the course. Tardy means arriving after the scheduled time for instruction to begin. Early departure means leaving before the end of the scheduled time. Three (3) tardies or early departures equal one (1) absence for the course involved. If you are 30 minutes late to class, you are considered absent for the day.

SPECIAL NEEDS

Students with disabilities who believe that they may need accommodations in this class based on the impact of a disability are encouraged to contact [Helen Thomas \(hthomas@southeasterntech.edu\)](mailto:hthomas@southeasterntech.edu), 912-538-3126, to coordinate reasonable accommodations.

SPECIFIC ABSENCES

Provisions for Instructional Time missed because of documented absences due to jury duty, military duty, court duty, or required job training will be made at the discretion of the instructor.

PREGNANCY

Southeastern Technical College does not discriminate on the basis of pregnancy. However, we can offer accommodations to students who are pregnant that need special consideration to successfully complete the course. If you think you will need accommodations due to pregnancy, please advise me and make appropriate arrangements with [Helen Thomas \(hthomas@southeasterntech.edu\)](mailto:hthomas@southeasterntech.edu), 912-538-3126.

WITHDRAWAL PROCEDURE

Students wishing to officially withdraw from a course(s) or all courses after the drop/add period and prior to the 65% portion of the semester (date will be posted on the school calendar) must speak with a Career Counselor in Student Affairs and complete a Student Withdrawal Form. A grade of "W" (Withdrawn) is assigned when the student completes the withdrawal form from the course.

Students who are dropped from courses due to attendance (see your course syllabus for attendance policy) after drop/add until the 65% point of the semester will receive a "W" for the course. Abandoning a course(s) instead of following official withdrawal procedures may result in a grade of "F" being assigned.

After the 65% portion of the semester, the student will receive a grade for the course. (Please note: A zero will be given for all missed assignments.)

There is no refund for partial reduction of hours. Withdrawals may affect students' eligibility for financial aid for the current semester and in the future, so a student must speak with a representative of the Financial Aid Office to determine any financial penalties that may be assessed due to the withdrawal. All grades, including grades of 'W', will count in attempted hour calculations for the purpose of Financial Aid.

Remember - Informing your instructor that you will not return to his/her course does not satisfy the approved withdrawal procedure outlined above.

MAKEUP GUIDELINES (TESTS, QUIZZES, HOMEWORK, PROJECTS, ETC.)

Exams or labs missed for any reason will be made up at the discretion of the instructor. A maximum of one

exam can be made up. If more than one exam is missed the student will only be allowed to make up the first exam missed and a grade of "0" will be awarded for any other missed exams including the final. If you are 30 minutes late for class, you are considered absent and missed the test. Remember, the first test can be made up and the second will be a zero, to include the final.

ACADEMIC DISHONESTY POLICY

The Southeastern Technical College Academic Dishonesty Policy states that all forms of academic dishonesty, including but not limited to cheating on tests, plagiarism, collusion, and falsification of information, will call for discipline. The policy can also be found in the Southeastern Technical College Catalog and Handbook.

PROCEDURE FOR ACADEMIC MISCONDUCT

The procedure for dealing with academic misconduct and dishonesty is as follows:

1. First Offense

Student will be assigned a grade of "0" for the test or assignment. Instructor keeps a record in course/program files and notes as first offense. The instructor will notify the student's program advisor, academic dean, and the Registrar at the student's home campus. The Registrar will input the incident into Banner for tracking purposes.

2. Second Offense

Student is given a grade of "WF" (Withdrawn Failing) for the course in which offense occurs. The instructor will notify the student's program advisor, academic dean, and the Registrar at the student's home campus indicating a "WF" has been issued as a result of second offense. The Registrar will input the incident into Banner for tracking purposes.

3. Third Offense

Student is given a grade of "WF" for the course in which the offense occurs. The instructor will notify the student's program advisor, academic dean, and the Registrar at the student's home campus indicating a "WF" has been issued as a result of third offense. The Vice President for Student Affairs, or designee, will notify the student of suspension from college for a specified period of time. The Registrar will input the incident into Banner for tracking purposes.

STATEMENT OF NON-DISCRIMINATION

The Technical College System of Georgia and its constituent Technical Colleges do not discriminate on the basis of race, color, creed, national or ethnic origin, sex, religion, disability, age, political affiliation or belief, genetic information, disabled veteran, veteran of the Vietnam Era, spouse of military member or citizenship status (except in those special circumstances permitted or mandated by law). This school is in compliance with Title VI of the Civil Rights Act of 1964, which prohibits discrimination on the basis of race, color, or national origin; with the provisions of Title IX of the Educational Amendments of 1972, which prohibits discrimination on the basis of gender; with the provisions of Section 504 of the Rehabilitation Act of 1973, which prohibits discrimination on the basis of handicap; and with the American with Disabilities Act (ADA).

The following individuals have been designated to handle inquiries regarding the nondiscrimination policies:

<p>American With Disabilities Act (ADA)/Section 504 - Equity- Title IX (Students) – Office of Civil Rights (OCR) Compliance Officer</p>	<p>Title VI - Title IX (Employees) – Equal Employment Opportunity Commission (EEOC) Officer</p>
<p>Helen Thomas, Special Needs Specialist Vidalia Campus 3001 East 1st Street, Vidalia Office 108 Phone: 912-538-3126</p>	<p>Blythe Wilcox, Director of Human Resources Vidalia Campus 3001 East 1st Street, Vidalia Office 138B Phone: 912-538-3147</p>

American With Disabilities Act (ADA)/Section 504 - Equity- Title IX (Students) – Office of Civil Rights (OCR) Compliance Officer	Title VI - Title IX (Employees) – Equal Employment Opportunity Commission (EEOC) Officer
Email: Helen Thomas hthomas@southeasterntech.edu	Email: Blythe Wilcox bwilcox@southeasterntech.edu

ACCESSIBILITY STATEMENT

Southeastern Technical College is committed to making course content accessible to individuals to comply with the requirements of Section 508 of the Rehabilitation Act of Americans with Disabilities Act (ADA). If you find a problem that prevents access, please contact the course instructor.

GRIEVANCE PROCEDURES

Grievance procedures can be found in the Catalog and Handbook located on Southeastern Technical College's website.

ACCESS TO TECHNOLOGY

Students can now access Blackboard, Remote Lab Access, Student Email, Library Databases (Galileo), and BannerWeb via the mySTC portal or by clicking the Current Students link on the [Southeastern Technical College \(STC\) Website \(www.southeasterntech.edu\)](http://www.southeasterntech.edu).

TECHNICAL COLLEGE SYSTEM OF GEORGIA (TCSG) GUARANTEE/WARRANTY STATEMENT

The Technical College System of Georgia guarantees employers that graduates of State Technical Colleges shall possess skills and knowledge as prescribed by State Curriculum Standards. Should any graduate employee within two years of graduation be deemed lacking in said skills, that student shall be retrained in any State Technical College at no charge for instructional costs to either the student or the employer.

GRADING POLICY

Chapter test average of 70 or higher is required to sit for the comprehensive final (grades of 69.9 will not be rounded up). You MUST pass all skills in this course to pass this course. Test and labs will be timed. Points will be deducted for spelling due to Medical Liability in the work place. Laboratory results are legal documents. NO GRADES WILL BE DROPPED!!! You must receive a "C" or higher in all CLBT, core, and clinical courses to progress in the CLT program.

Assessment/Assignment	Percentage
Chapter tests	60%
Instrument presentation	10%
Lab Reports	5%
Comprehensive Final	25%

GRADING SCALE

Letter Grade	Range
A	90-100
B	80-89
C	70-79
D	60-69
F	0-59

**CLBT 1070 CLINICAL CHEMISTRY
SPRING SEMESTER 2018 LESSON PLAN**

WEEK	CHAPTER	CONTENT	ASSIGNMENTS & TESTS DUE	COMP AREA
1 & 2 January 8-10; (Holiday is 15 th) 16-17	1,2,3	Syllabi review 1: Basic Principles and Practices 2: Phlebotomy and Specimen Considerations 3: Lab Safety and Regulations	Read assigned chapter Lab Safety handout sheet Assign Instrumentation Presentation Immunizations, Drug screen, and background check required. Serial dilution lab Pipetting lab Dilutions lab	Course 4,9,11,12 Core A-C
3 January 22-24	4,5	4: Quality Control (QC) and Statistics 5: Analytical Techniques Instrumentation/Trouble-shoot equipment	Read assigned chapter QC Lab/Trouble shoot QC Linearity Lab	Course 4,9,11,12 Core A-C
4 January 29-31	10	10: Amino Acids and Proteins	Read assigned chapter TEST 1-5 Khan academy videos : 3 videos	Course 3,9,11,12 Core A,C
5 February 5-7	11	11: Non protein Nitrogen Compounds	Read assigned chapter	Course 3,9,10,11,12 Core A-C
6 February 12-14	12	12: Enzymes	Read assigned chapter	Course 4,5,10,12 Core A-C
7 February 19-21	13	13: Carbohydrates	Read assigned chapter Test :Chapters 10,11,12	Course 1,10,11,12 Core A-C
8 February 26-28	14	14: Lipids and Lipoproteins	Read assigned chapter	Course 7,9,10 Core A-C
9 March 5-7	15	15: Electrolytes	Read assigned chapter	Course 2,4,9,10 Core A-C
10 March 12-14	16	16: Blood Gases, pH and Buffer Systems	Test Chapters 13,14,15 Practice: acid/ base handout	Course 2,9,10 Core A-C
11 March 19-21	24	24: Liver Function	Read assigned chapter	Course 6,10 Core A-C
12 March 26-28	25	25: Cardiac Function	Read assigned chapter Students draw chemistry lab Piccolo lab	Course 4,5,10 Core A-C

WEEK	CHAPTER	CONTENT	ASSIGNMENTS & TESTS DUE	COMP AREA
13 April 2-5 is Spring break! April 9-11	17,29,30	17: Trace Elements 29:Therapeutic Drug Monitoring 30: Toxicology	Read assigned chapter Test 16,24,25 Hormones Hand out	Course 4,8,10,12 Core A-C
14 April 16-18	22,31	22: Thyroid 31: Tumor markers	Read assigned chapter Vitamin Hand out Calculations skills Correlate lab values to disease states	Course Core A-C
15 April 23-25	Review	Review	TEST 17,22,29,30,31,& Vitamins Review Polanski cards, study stack, Clinical Lab review, Handouts and Purpose of the test	Course 1-12 Core A-C
16 April 30- May 2	Review	Finals	Comprehensive Final	Course 1-12 Core A-C

MAJOR COURSE COMPETENCIES:

1. Carbohydrates,
2. Electrolytes and acid-base balance,
3. Nitrogenous compounds,
4. Related lab math
5. Enzymes and endocrinology,
6. Liver functions,
7. Lipids,
8. Toxicology and therapeutic drug monitoring,
9. Safety and quality control,
10. Correlation of disease states,
11. Process improvement (team approach),
12. Critical thinking skills

GENERAL CORE EDUCATIONAL COMPETENCIES:

- A. The ability to utilize standard written English.
- B. The ability to solve practical mathematical problems.
- C. The ability to read, analyze, and interpret information