



CLBT 1070 Clinical Chemistry  
Course syllabus  
Spring 2016

Semester: Spring 2016  
Course Title: Clinical Chemistry  
Course Number: CLBT 1070  
Credit Hours/ Minutes: 4/6000  
Class Location: Room #739 Gillis Building  
Class Meets: MTW 12:30pm-3:15pm  
CRN: 40192

Instructor: Cynthia Williams, MS, MT(AMT)(HHS)  
Office Hours: 7:30-8am;3:30-5pm  
Office Location:716 Gillis Building  
Email Address: cwilliams@southeasterntech.edu  
Phone: 912-538-3183  
Fax Number: 912-538-3106

**REQUIRED TEXT:** *Clinical Chemistry, Principles, Procedures, Correlations*, 6th Edition, Bishop, Michael L. et al. Lippincott Williams & Wilkins Publishers. **Suggested reading:** *The Spirit Catches You and You Fall Down*

**REQUIRED SUPPLIES & SOFTWARE:** Ink pens, pencil, highlighter, permanent marker, paper and any other supplies deemed necessary by instructor. Calculator is provided.

**METHODS OF INSTRUCTION:**

May include, but not limited to, lectures, discussions, videos, laboratory skills, and handouts.

**COURSE DESCRIPTION: 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

**General Core Educational Competencies:** STC has identified the following general education core competencies that graduates will attain:

- 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.

**PREREQUISITE(S): BIOL 2114, BIOL 2114L, Chem 1151, CLBT 1010**

**COURSE OUTLINE:**

**Learning Outcomes**

**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 <sub>2</sub> ) content in the blood.	Cognitive	Comprehension
5	Discuss carbon dioxide (CO <sub>2</sub> ) procedures.	Cognitive	Comprehension
6	Discuss the carbonate-bicarbonate buffer system.	Cognitive	Comprehension
7	Discuss blood gases.	Cognitive	Comprehension
8	Interpret 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 BUN, uric acid, proteins, and creatinine/creatinine.	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
5	Perform selected tests.	Psychomotor	Guided Response
6	Discuss the critical factors relating to 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 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), LDL-Chol, LDL:HDL ratio, Indirect bilirubin, %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
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

**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/CLT handbook*. *Students are required to read the chapter prior to class. Test will be timed. Points will be deducted for spelling due to Medical Liability in the work place. Laboratory results are legal documents.*

**No cell phones allowed.** If you are caught using the cell phone, you will be asked to leave class and receive an “early departure” for the class. (Note: Three (3) tardies or early departures equal one (1) absence for the course involved.) **If you are 30 minutes late to class, you will receive an absence for the day.**

**STC ATTENDANCE POLICY:** It is essential that educational programs maintain requirements and standards necessary for successful employment of its graduates in business and industry. In view of the intensive nature of the educational programs, it is necessary for every student to be present and on time every day for all classes.

**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.**

**Withdrawing from Learning Support and/or College Success and Survival Skills courses are not permitted unless the student intends to withdraw totally from the College.**

**TRADITIONAL ATTENDANCE ADDENDUM:** For this class, which meets 3 days a week for 15 weeks, the maximum number of days a student may miss is 5 days during the semester.

**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.

**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 Jan Brantley, Room 2108 Swainsboro Campus, 478-289-2274, or Helen Thomas, Room 108 Vidalia Campus, 912-538-3126, to coordinate

reasonable accommodations.

**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 the Special Needs Office. Swainsboro Campus: Jan Brantley, Room 1208, (478) 289-2274 -- Vidalia Campus: Helen Thomas, Room 108, (912) 538-3126.

**MAKEUP GUIDELINES:** 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.**

**ACADEMIC DISHONESTY POLICY:** The STC Academic Dishonesty Policy states *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 *STC Catalog and Student Handbook*.

**Procedure for Academic Misconduct**

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

**--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.

**--Second Offense--**

Student is given a grade of **"WF" 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.

**--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 second 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:** Southeastern Technical College does not discriminate on the basis of race, color, creed, national or ethnic origin, gender, religion, disability, age, disabled veteran, veteran of Vietnam Era 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).

**GRIEVANCE PROCEDURES:** Grievance procedures can be found in the Catalog and Handbook located on STC'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 STC website at [www.southeasterntech.edu](http://www.southeasterntech.edu).

**GRADING:** Chapter test average of 70 or higher is required to sit for the final skills lab exam and comprehensive final (**grades of 69.9 will not be rounded up**). **Your grade for the course will be the average of your chapter exams. Only one makeup exam will be given for chapter test. If you miss a second exam you will receive a zero for the second exam missed. 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.

*GRADING POLICY:*

<i>Chapter test</i>	=60%
<i>Instrument Presentation</i>	=10%
<i>Lab Reports</i>	= 5%
<i>Comprehensive Final</i>	=25%

**GRADING SCALE**

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

**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.*



**CLBT 1070 Clinical Chemistry  
SPRING SEMESTER 2016 LESSON PLAN**

**Lesson Plan is subject to change at the discretion of the instructor.**

<b>Week</b>	<b>Chap / Less</b>	<b>Content</b>	<b>Assignments &amp; Tests Due</b>	<b>Comp Area</b>
<b>Week 1 &amp; 2 January 11,19-21 Holiday Jan.18!</b>				
1 & 2	1,2,3	Syllabi review 1: Basic Principles and Practices  2: Phlebotomy and Specimen Considerations  3: Lab Safety and Regulations	Lab Safety handout sheet Assign Instrumentation Presentation TCSG standards Immunizations, Drug screen, and background check required. Serial dilution lab Pipetting lab Dilutions lab	Course 4,9,11,12 Core A-C
<b>Week 3 January 25-28</b>				
3	4,5	4: Quality Control and Statistics  5: Analytical Techniques and Instrumentation/Trouble-shoot equipment	QC Lab/Trouble shoot QC Linearity Lab	Course 4,9,11,12 Core A-C
<b>Week 4 Feb.1-4</b>				
4	10	10: Amino Acids and Proteins	TEST 1-5	Course 3,9,11,12 Core A,C
<b>Week 5 Feb. 8-11</b>				
5	11	11: Nonprotein Nitrogen Compounds		Course 3,9,10,11,12 Core A-C

Week 6 Feb. 15-18				
6	12	12: Enzymes		Course 4,5,10,12  Core A-C
Week 7 Feb. 22-25				
7	13	13: Carbohydrates	Test :Chapters 10,11,12	Course 1,10,11,12 Core A-C
Week 8 Feb.29-March 3				
8	14	14: Lipids and Lipoproteins		Course 7,9,10 Core A-C
Week 9 March 7-10				
9	15	15: Electrolytes		Course 2,4,9,10 Core A-C
Week 10 March 14-17				
10	16	16: Blood Gases, pH and Buffer Systems	Test Chapters 13,14,15  Practice: acid/ base handout	Course 2,9,10 Core A-C
Week 11 March 21-24 Holiday 29-31!!!				
11	24	24: Liver Function		Course 6,10 Core A-C
Week 12 April 4-7				
12	25	25: Cardiac Function	Students draw chemistry lab Piccolo lab	Course 4,5,10 Core A-C

<b>Week 13 April 11-14</b>				
13	17,29,30	17: Trace Elements 29:Therapeutic Drug Monitoring 30: Toxicology	<b>Test 16,24,25</b>	Course 4,8,10,12 Core A-C
<b>Week 14 April 18-21</b>				
14	22,31	22: Thyroid 31: Tumor markers Vitamin Hand out	Calculations skills Correlate lab values to disease states	Course Core A-C
<b>Week 15 April 25-28</b>				
15		Review	<b>TEST 17,22,29,30,31,Vitamin</b> Review Polanski cards, study stack, Clinical Lab review, Handouts and Atlas TCSG standards due	Course 1-12 Core A-C
<b>Week 16 May 2-5</b>				
16		<b>Review Finals</b>	<b>Comprehensive Final</b>	Course 1-12 Core A-C

**MAJOR COURSE COMPETENCIES:**

- 1) Carbohydrates,
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