



The University of Texas at El Paso  
College of Health Sciences  
Clinical Laboratory Science Program



CLSC 2210: Introduction to Clinical Laboratory Science  
Syllabus  
Fall 2022

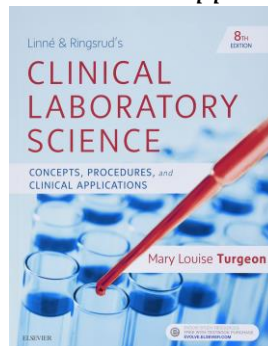
I. Course Information

**Days:** Monday and Wednesday

**Time:** 12:00pm – 12:50pm

**Room:** College of Health Sciences (CHS) 135

**Textbook:** Turgeon, Mary L. 2020. *Linné & Ringsrud's Clinical Laboratory Science: Concepts, Procedures and Clinical Applications. 8th Edition.* Elsevier.



II. Instructor Information

**Instructor:** Nancy D. Cruz-Sanchez, MS, MLS (ASCP)<sup>CM</sup>

**Email:** ndcruzsanch@utep.edu

**Office:** College of Health Sciences (CHS) 426

**Office Phone Number:** 915-747-7243

**Office Hours:** BY APPOINTMENT

Monday and Wednesday: 1:00pm – 4:00pm

Friday: 11:00am – 2:00pm

- In order to better assist you, please make sure you **schedule an appointment**. If you can't schedule during these times, please contact me (after class/lab or via email) to schedule another time.
  - Multiple students may be scheduled for the same office hour session.
  - If it is a private matter, you wish to discuss material or have questions and prefer to have a private office hour or online session, please make sure to notify the instructor when appointment is being made.
  
- Online meetings may be scheduled (Zoom, Teams).

- **Students must use their UTEP email when communicating, for appointments, questions, etc.**
  - **Emails received:**
    - **Monday through Thursday after 5:00pm will be replied to the next day.**
    - **Friday after 4:00pm will be replied Monday (or next business day if it is a holiday).**
    - **Saturday and/or Sunday will be replied Monday (or next business day if it is a holiday).**
    - **Holidays will be replied to the next business day.**
- **Instructor is also available after class/lab (unless another class is on her schedule).**
- **If instructor is not in her office, she may be in CHS 137 Laboratory Prep Room preparing for laboratories. Students may attend office hours in prep room with instructor.**

### **III. Course Description**

Clinical Laboratory Sciences is a profession that serves as a vital partner in clinical diagnosis and medical decision making. Clinical laboratory scientists perform laboratory analysis to diagnose, treat, and monitor disease, monitor treatment, and to evaluate the maintenance of an individuals' health. These healthcare professionals are experts in the scientific disciplines of clinical chemistry, hematology, immunology/serology, immunohematology (blood bank), urinalysis/body fluids, and microbiology.

This course will provide a general overview of clinical laboratory science (CLS) as well as career opportunities and educational requirements. During this course you will learn about the organization and function of a typical clinical laboratory, routine tests performed, basic information about each of the scientific disciplines of CLS and new technologies within the field. Related laboratory professions, such as cytotechnology and histotechnology, will be briefly introduced, which are considered within the clinical laboratory.

### **IV. Course Goal**

This course intends to provide the student with the knowledge of fundamental concepts of clinical laboratory science and introduce the student to the clinical laboratory science profession and a concise description of the different areas that make up the laboratory. It also intends to:

- **Stimulate professional and self-development so they will be successful in the CLS program and future professional careers.**
- **Stimulate and enjoy life-long learning.**
- **Train and develop analytical thinking individuals to enable them to identify, troubleshoot and discuss laboratory findings.**
- **Instill love and understanding of the profession.**

- Instill ethical responsibility.
- Promote the need to engage in the profession's development, community, professional activities, and civil matters.

## V. Course Objectives

### A. Cognitive

Upon completion of this course the student will be able to do the following accordingly to each chapter:

1. Define Clinical Laboratory Science.
2. Describe the role of the clinical laboratory scientist in health care.
3. Explain the function of the clinical laboratory in the diagnosis, treatment, and prevention of disease.
4. Describe, in general terms, the organization of the Health Care System in the U.S. including hospitals and clinics.
5. Identify and differentiate Clinical Laboratory Scientists in relation to other health care professionals.
6. Describe the basic organization of a clinical laboratory.
7. Understand the differences between certification and licensure.
8. Compare and contrast Clinical Laboratory Scientist (CLS) vs Clinical Laboratory Technician (CLT) (Medical Laboratory Scientist (MLS) vs Medical Laboratory Technician (MLT)).
9. List the laboratory departments in a clinical laboratory.
10. Discuss the ethics of health professions.
11. Explain the purpose of joining professional organizations.
12. Explain what universal precautions are.
13. Describe basic principles of infection control including personal protective equipment (PPE).
14. Explain successful implementation of chemical hazards.
15. Recognize the importance of safety, quality assurance and quality control in the clinical laboratory.
16. Define terms used in QC (accuracy, precision, sensitivity, specificity).
17. Differentiate quality control (QC) and quality assurance (QA).
18. Describe the various types of volumetric glassware, the techniques for their use, and the various types of glass to manufacture them.
19. Compare various types of centrifuges.
20. List and describe the various grades of chemicals used in the laboratory including the levels of quality and purpose.
21. Describe overall product and functions of lab information systems.
22. Describe the five steps in automated analysis.
23. List the routine tests performed in chemistry, hematology, immunohematology, and microbiology departments
24. Describe the function of the hematology, chemistry, microbiology, and immunohematology departments.
25. Summarize the process of blood formation.
26. Differentiate among the different types of leukocytes.

27. Describe the appearance and function of platelets.
28. Define the terms hemoglobin, erythropoietin, hematocrit, mean corpuscular volume (MCV).
29. Differentiate plasma from serum.
30. Differentiate between normal values and panic values.
31. Define key terms in chemistry: cholesterol, cardiac panel, liver panel, complete metabolic panel, etc.
32. Differentiate various states related to abnormal urine chemistry analysis.
33. Compare the methods available for urine chemistry analysis.
34. Explain the importance of fecal occult testing.
35. Define normal flora and explain the role in the human body.
36. Differentiate among the different types of organisms analyzed in the microbiology lab (bacteria, fungi, parasites, viruses).
37. Differentiate sterilization vs. disinfection.
38. Describe 3 main steps in the identification of bacteria.

#### B. Affective

Upon completion of this course, the student will be able to exhibit the appropriate responsible behaviors by demonstrating:

1. A positive attitude by being prepared for each session, completing assigned tasks on time, and displaying self-motivation.
2. Organization by utilizing time effectively, sequencing, and prioritizing tasks for completion with time constraints and maintaining a neat clean work.
3. Attention to detail by diligently pursuing accuracy and documenting data/notes accurately and legibly.
4. Problem solving ability by explaining purpose of each step in: diagnosis, interpretation, procedure, recognizing discrepancies in techniques or procedures and repeating necessary lab tests when necessary.
5. Dependability by following directions, working independently after being given directions.
6. Stability and self-confidence by approaching and performing routine tasks confidently without assistance and maintaining composure.
7. Appropriate interpersonal skills by cooperating and communicating effectively with classmates and instructors and displaying courteous, considerate behavior and appropriate appearance.
8. Ethical behavior and integrity by respecting confidentiality of patient information, complying with professional standards and code of ethics, adhering to safety policies, and abiding by all rules and regulations of the institution.

## VI. Course Policies

A. Textbook: Turgeon, Mary L. 2020. *Linné & Ringsrud's Clinical Laboratory Science: Concepts, Procedures and Clinical Applications. 8th Edition.* Elsevier.

### B. Instructional Policies

1. Material and resources for the class will be provided using the following:
  - a. Classroom lectures
    - Power Point
    - PDF
  - b. Blackboard
  - c. You Tube
2. Announcements, updates, notifications, and other important messages will be posted to Blackboard announcements.
  - a. It is the student's responsibility to check blackboard on a regular basis.
3. Students will be divided into groups randomly.
  - a. Study groups are meant to be help and support for all students through the semester.
  - b. All members ***must*** participate in class discussion.
4. An outline/study guide for each chapter/lecture will be uploaded to Blackboard in advance.
  - a. Students are ***strongly encouraged*** (should) to complete the outline/study ***before*** coming to class.
  - b. Outline/study guide will be discussed in class by students and guided by instructor.
  - c. There may be unannounced quizzes at the beginning of the class regarding the outline/study guide to be discussed that day.
  - d. Outline/study guide completion is strongly encouraged to be done with study group.
    - All members ***must*** participate in outline/study guide discussion in class.
5. The student must have available or have access to the following technological resources:
  - a. Computer/laptop with camera (webcam), audio and microphone.
  - b. USB flash drive
  - c. Good internet connection
  - d. Microsoft Office (Word, Power Point, Excel)
  - e. Adode (PDF) Flashplayer

- f. Windows Media Player
- g. Internet browser (i.e., Google Chrome, Mozilla Firefox)
- h. Blackboard's Respondus LockDown Browser

#### 6. LockDown Browser + Webcam Requirement

- a. This course requires the use of LockDown Browser and a webcam for online quizzes and exams. The webcam can be the type that's built into your computer or one that plugs in with a USB cable. Watch this brief video to get a basic understanding of LockDown Browser and the webcam feature.
  - <https://www.respondus.com/products/lockdown-browser/student-movie.shtml>
- b. Download Instructions
  - Download and install LockDown Browser from this link:<https://download.respondus.com/lockdown/download.php?id=586140509>
  - Once Installed:
    - ◊ Start LockDown Browser
    - ◊ Log into Blackboard Learn
    - ◊ Navigate to the test
    - ◊ Note: You won't be able to access tests with a standard web browser. If this is tried, an error message will indicate that the test requires the use of LockDown Browser. Simply start LockDown Browser and navigate back to the exam to continue.
- c. Guidelines
  - When taking an online test, follow these guidelines:
    - ◊ Ensure you're in a location where you won't be interrupted
    - ◊ Turn off all other devices (e.g., tablets, phones, second computers) and place them outside of your reach
    - ◊ Before starting the test, know how much time is available for it, and that you've allotted sufficient time to complete it
    - ◊ Clear your desk or workspace of all external materials not permitted - books, papers, other devices
    - ◊ Remain at your computer for the duration of the test
    - ◊ If the computer, Wi-Fi, or location is different than what was used previously with the

"Webcam Check" and "System & Network Check" in LockDown Browser, run the checks again prior to the exam

- ◊ To produce a good webcam video, do the following:
  - i. Avoid wearing baseball caps or hats with brims
  - ii. Ensure your computer or device is on a firm surface (a desk or table). Do NOT have the computer on your lap, a bed, or other surface where the device (or you) is likely to move
  - iii. If using a built-in webcam, avoid readjusting the tilt of the screen after the webcam setup is complete
  - iv. Take the exam in a well-lit room but avoid backlighting (such as sitting with your back to a window).

d. Remember that LockDown Browser will prevent you from accessing other websites or applications; you will be unable to exit the test until all questions are completed and submitted.

e. Getting Help

- Several resources are available if you encounter problems with LockDown Browser:
- The Windows and Mac versions of LockDown Browser have a "Help Center" button located on the toolbar. Use the "System & Network Check" to troubleshoot issues. If an exam requires you to use a webcam, also run the "Webcam Check" from this area.
- As applicable, insert information about your institution's help desk, including details about how to contact them. Some help desks want students to run the "System & Network Check" and the "Webcam Check" before they are contacted - and even, to forward the results of these checks at the time of opening a ticket.
- Respondus has a Knowledge Base available from [support.respondus.com](https://support.respondus.com). Select the "Knowledge Base" link and then select "Respondus LockDown Browser" as the product. If your problem is with a webcam, select "Respondus Monitor" as your product.

- If you're still unable to resolve a technical issue with LockDown Browser, go to support.respondus.com and select "Submit a Ticket". Provide detailed information about your problem and what steps you took to resolve it.

### C. Quiz and Exam Policy

1. Quizzes and Exams will be taken in the classroom using Blackboard Respondus LockDown Browser + Webcam.
2. **Quizzes may be announced or unannounced.**
3. **No** make-up exams or quizzes will be administered.
4. If an exam or quiz is missed the grade will be 0. All grades will be used for calculating the final grade, no grades will be dropped.
5. If a student cannot attend a test, quiz, or final exam for a **university-acceptable excuse**, inform the instructor as soon as possible and a time will be arranged accordingly with the instructor's schedule. It is responsibility of the student to notify the instructor of any absence and to provide legitimate documentation of absence as per university regulations.
6. The instructor will assign each student a seat for the examination.
7. All personal belongings including material, documents, book, etc. must be kept in the designated area assigned by the instructor.
8. If a calculator is needed for the exam, the instructor will let you know ahead of time. Calculator lids must be kept with your personal belongings. The instructor will check the calculators (especially if a scientific or graphic calculator is being used).

### D. Assignment Policy

1. Assignments will be announced and assigned 1 to 2 weeks before the deadline.
2. Deadlines will be announced previously as assignments are programmed and requested throughout the semester.
  - a. Students are required to submit assignments in a timely manner.
  - b. Failure to submit/complete an assignment in a timely manner will lead to a 2-point deduction each day the assignment is late (includes weekends and holidays).
    - If a legitimate reason/excuse (death, illness, etc.) prevents the student from handing the assignment on the due date, inform the instructor as soon as possible, bring the necessary documentation and considerations may be made, depending on situations, on an individual basis.
    - **NO** make-up assignments will be offered.



- c. Assignments are to be submitted **neatly** and in ink or typed and uploaded to corresponding Blackboard folder. They must also be properly identified (name, date).

#### E. Attendance and Participation Policies

1. The student is expected to attend ***all*** lecture sessions in a **timely fashion**.
2. The student is expected to participate during class sessions.
3. The student is expected to access Blackboard regularly for material availability, announcements, etc.
4. The student should spend 4-6 hours a week studying the material and resources provided by the instructor and textbook.
5. Absences: After 3 absences you will be given a written warning. If absent 4 times, you may be dropped from the course.
6. Tardiness: Students arriving after 10 minutes will be considered tardy.
7. It is the responsibility of the student to notify the instructor of any absence or tardiness, and to provide legitimate documentation of absence as per university regulations.
  - a. The student is responsible for the material discussed in class as well as announcements made in class.
8. The instructor reserves the right to drop a student due to tardiness or absenteeism, when, in the judgement of the instructor, a student has been absent to a degree as to impair their status relative to credit for the course. The instructor may drop the student from the class with a “**W**” before the course drop deadline or an “**F**” after the course drop deadline.
  - a. Course **Drop** Deadline: October 28, 2022
9. The student is expected to participate in office hours.
  - a. Multiple students may be scheduled for the same office hour session.
  - b. If it is a private matter or you wish to discuss material or have questions and prefer to have a private office hour or online session, please make sure to notify the instructor when appointment is being made.

#### F. Classroom Policies

1. The student will present to the classroom wearing appropriate clothing, i.e.:
  - a. No cleavage, see through or short (crop tops) shirts or tops.
  - b. No short shorts, hot pants, or leggings.
2. Cell phone usage is **NOT** permitted in the classroom.
  - a. Exceptions can be made in case of an emergency. **Please talk to the instructor beforehand.**

- b. Phone **MUST** remain in silent mode inside your backpack, purse, pocket, etc.
3. Masks are not mandated for students, faculty, or staff in the classroom or at UTEP (per UTEP policies). However, if the student prefers to wear a mask, they can do so.
  - a. **This policy is subject to change depending on public health circumstances and UTEP policy change regarding this matter.**
4. COVID-19 PRECAUTION STATEMENT
  - a. Please stay home if you have been diagnosed with COVID-19 or are experiencing COVID-19 symptoms.
  - b. If you are feeling unwell, please let instructor know as soon as possible, so that appropriate accommodations can be made.
  - c. If you have tested positive for COVID-19, you are encouraged to report your results to covidaction@utep.edu, so that the Dean of Students Office can provide you with support and help with communication with your professors. The Student Health Center is equipped to provide COVID-19 testing.
  - d. The Center for Disease Control and Prevention recommends that people in areas of substantial or high COVID-19 transmission wear face masks when indoors in groups of people. The best way that Miners can take care of Miners is to get the vaccine. If you still need the vaccine, it is widely available in the El Paso area, and will be available at no charge on campus during the first week of classes. For more information about the current rates, testing, and vaccinations, please visit epstrong.org.

#### G. Etiquette guidelines

1. Treat instructor and classmates with respect.
2. Address instructor and classmates properly and accordingly.
3. Use clear and appropriate language.
4. Vulgar/obscene language, discrimination for race, color, ethnicity, gender, political or religious views, and inappropriate conduct is ***prohibited*** in class.
5. The instructor reserves the right to ban the student from the classroom if vulgar language is being used if student is being disrespectful toward the instructor or classmates or exhibiting inappropriate conduct. This will be considered an absence. The student will be reported to the CLS program director.

## H. Academic Integrity

There is a **zero-tolerance level** for academic dishonesty. Honesty and integrity are a critical aspect of your chosen profession, as well as patient confidentiality. Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes, but it is not limited to:

### 1. Cheating

This means:

- a. Copying from the homework, in-class work, or exam paper of another student.
- b. Engaging in written, oral, or any other means of communication with another student during an exam or homework assignment or giving aid to or seeking aid from another student during a test.
- c. Possession and/or use of test material (class notes, books, reviews, outlines, or any other material) not authorized by the instructor or exam proctor during an exam or quiz.
- d. Using, obtaining, or attempting to obtain, by any means, a part of the whole test, test key, homework solution, computer program, and tests administered during past semesters.
- e. Substituting for another person or another person substituting oneself to take a test/quiz.
- f. Falsifying data, laboratory reports and/or other records or academic work offered for credit.

### 2. Plagiarism

This means:

- a. The appropriation, buying, receiving as a gift, or obtaining by any means another's work, ideas, processes, results, or words without giving appropriate credit. This includes intentionally, knowingly, or carelessly, presenting the work of another as one's own; failing to credit sources used in a work product; attempting to receive credit for work performed by another; failing to cite the World Wide Web, databases, and other electronic resources.
- b. The submission for credit of any work or material that is attributable (whole or in part) to another person (i.e., copying from another student).

### 3. Collusion

This means the unauthorized (secret or illegal) collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any provision of the rules on scholastic dishonesty.

Proven violations of the detailed regulations, as printed in the *Handbook of Operating Procedures (HOP)* (available in the Office of the Dean of Students), may result in sanctions ranging from disciplinary probation, failing grades on the work in question, failing grade in the course, suspension, or dismissal, among others.

I. Student Support

In case of needed assistance:

1. Helpdesk
  - a. <https://www.utep.edu/irp/technologysupport/>
2. Miner Learning Center
  - a. <https://www.utep.edu/mlc/>
3. University Library
  - a. <https://www.utep.edu/library/>
4. Counseling and Psychological Services
  - a. <https://www.utep.edu/student-affairs/counsel/>
5. Student Support Services Program
  - a. <https://www.utep.edu/student-affairs/student-support-services-program/>

J. Classroom Accommodations

If you have a disability and need special accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, by email to [cass@utep.edu](mailto:cass@utep.edu), or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at [www.sa.utep.edu/cass](http://www.sa.utep.edu/cass).

## VII. Grading Policy

<b>Evaluation Technique</b>	<b>%</b>
Assignments	10%
4 Partial Exams	15% each (60% total)
Final	30%
<b>Total</b>	<b>100%</b>

<b>Grading Scale</b>	<b>Grade</b>
90-100	A
80-89	B
75-79	C
70-74.9*	D*
69 or below*	F*
<b>* A grade of 75 or above is required to pass.</b>	

## VIII. Lecture Schedule\*

<b>Week</b>	<b>Date</b>	<b>Topic/Chapter</b>
1	August 22 August 24	Introductions, Syllabus & Schedule Discussion The CLS Program at UTEP
2	August 29 August 31	History of the Clinical Laboratory Overview of the Clinical Laboratory
3	September 5 September 7	<b>Labor Day</b> Regulations Governing Laboratory Personnel
4	September 12 September 14	Laboratory Safety Assuring Quality (Quality Assurance and Quality Control)
5	September 19 September 21	Legal and Ethical Issues <b>Exam #1</b>
6	September 26 September 28	Systems of Measurement, Equipment and Reagents Basic Techniques
7	October 3 October 5	Laboratory Information Systems (LIS) Specimen Collection and Processing
8	October 10 October 12	<b>Exam #2</b> Overview of Clinical Chemistry and Select Tests
9	October 17 October 19	Select Chemistry Tests (cont.)
10	October 24 October 26	Overview of Hematology Select Hematology Tests
11	October 31 November 2	Urinalysis <b>Exam #3</b>
12	November 7 November 9	Introduction to Clinical Microbiology Tests in Microbiology
13	November 14 November 16	Introduction to Immunology Introduction to Immunochemistry (Blood Bank)
14	November 21 November 23	Blood Bank II Introduction to Molecular Diagnostics
15	November 28 November 30	<b>Exam #4</b> TBD (Visit to a Clinical Laboratory)
16	December TBD	<b>Final Exam Time and Room TBD</b>

**\*Schedule subject to change**