

UTEP Clinical Laboratory Science

Hematology Lab

CLSC 3257



**UTEP
HEMATOLOGY**

**BEFORE COMING TO CAMPUS STUDENTS MUST SIGN IN
USING THE FOLLOWING WEB SITE:**

<https://adminapps.utep.edu/screening/Home/Launch>

THE UNIVERSITY OF TEXAS AT EL PASO
COLLEGE OF HEALTH SCIENCES
CLINICAL LABORATORY SCIENCE PROGRAM

HEMATOLOGY LABORATORY
CLSC 3257

COURSE: CLSC 3257 – Clinical Hematology Lab

LABORATORY SCHEDULE

Room 137 in the College of Health Sciences

Lab A: Monday and Tuesday from 1:00 – 4:00 p.m.

Lab B: Wednesday and Thursday from 1:00 – 4:00 p.m.

Masks and CLS Laboratory Scrubs will be worn by the students when attending laboratory.

INSTRUCTOR: M. Lorraine Torres, Ed.D. MT (ASCP)

OFFICE College of Health Sciences (CHS) Room 423

Phone: 747-7282

e-mail: lorit@utep.edu

OFFICE HOURS: Due to COVID 19 pandemic, office hours will be held virtually.
Tuesday and Wednesday from 10:00 – 11:00; Friday 1:00 – 2:00 p.m. or by appointment

If for some reason you are not able to see me at this time, you are welcome to see me after class or we can arrange an appointment at another time. You can also schedule meetings with me by e-mail. I would like to invite you to use the office hours to clarify points you did not understand in lab, to discuss subject matter according to your special interests or talk about your career goals. **If you feel confused and lost please come and see me;** Please do not wait until the last minute. The best time to reach me by phone is during my office hours. If I do not answer, please leave a detailed message and I will return your call as soon as possible.

COURSE DESCRIPTION:

This course is designed to develop the skills and techniques necessary to recognize and identify normal and abnormal components of the hematopoietic system. This course involves the study of maturation, morphology and function of blood cells and their role in disease processes. Emphasis is placed on both manual and automated laboratory procedures, cell identification, and the relationship of cells with specific diseases such as anemias, leukemias, lymphomas, and reactive processes. This course includes the principles and practices of quality control and pre-analytical, analytical and post analytical components of hematology and the application of safety to laboratory practice.

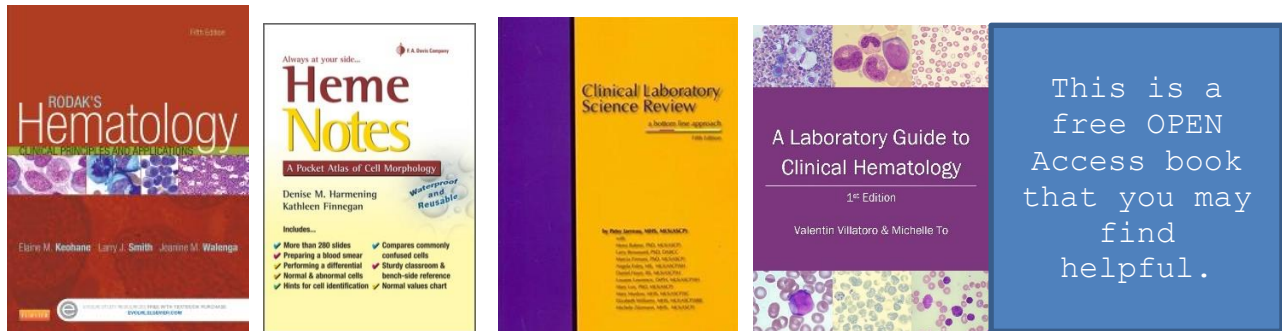
Corequisite: CLSC 3356.

COURSE GOAL:

This course is designed to provide basic laboratory experience in the hematology laboratory. Taken in conjunction with CLSC 3356, the student will learn to competently perform basic manual hematology procedures and correctly interpret the findings, given adequate clinical data.

TEXTBOOKS:

The same books for the Hematology Lecture: The focus will on chapters 1 – 5 and 14 – 16 in the Rodak's Hematology text. Heme Notes is also a great companion to have and keep in your pocket.



<https://openeducationalberta.ca/mlsci/>

STUDENTS WITH DISABILITIES: If you have a disability and need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to 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. Class accommodations are not given retroactively.

Students must follow CDC standards for social distancing and wearing face masks in and out of scheduled laboratories. Be advised that if any student comes down with COVID 19, CLS Laboratories will be cancelled and the students will receive an incomplete if all scheduled labs are not completed by the end of the fall 2020 semester.

CLS STUDENTS WILL NOT BE ALLOWED IN THE LABORATORY WITHOUT WEARING A MASK OR THE CLS DESIGNATED SCRUBS AND PROPER PERSONAL PROTECTIVE COVERING. SEE NEXT PAGE FOR SPECIFICS ON ENTERING THE LABORATORY

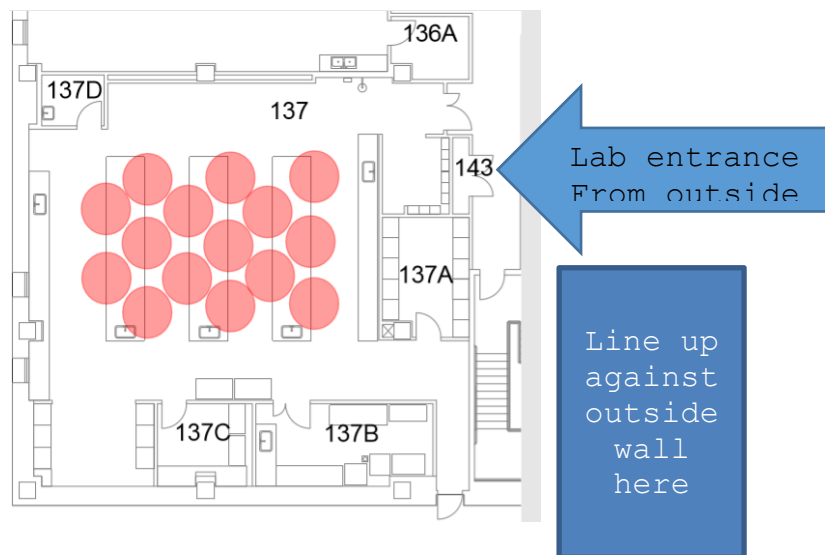
UNIVERSAL PRECAUTIONS WILL BE OBSERVED AT ALL TIMES. AT THE INSTRUCTORS DISCRESSION, A STUDENT WHO DOES NOT HAVE THE PROPER PERSONAL PROTECTION EQUIPMENT MAY BE DISMISSED.



Clinical Laboratory Science Program
COVID-19 Fall 2020 Student Laboratories
Entrance to CHS 137 Procedure

In response to the SARS CoV-2 outbreak, the UTEP Clinical Laboratory Science (CLS) Program has developed a Work and Safety Plan for conducting student laboratories according to CDC and OSHA Guidelines. Similar to influenza viruses, SARS-CoV-2 has the potential to cause extensive outbreaks under conditions associated with person-to-person spread. In the absence of a vaccine, the CLS Program has implemented measures to reduce risk of exposure to SARS CoV-2 in student laboratories.

Students will be dispersed according the diagram below. The laboratory is marked with signage as to the direction is which students are allowed to walk.



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1. Students must wear a mask while walking to the building and waiting outside or walking out side. There is only one entrance to the building. It is the door on the first floor next to the lab entrance. If you are late to lab, you will not be allowed in the building. All the doors to the building are locked. Arrive at 8:30 A.M. and wait outside for processing into the laboratory.

2. Line up on one of the marked areas outside of the building as depicted in diagram above. If you are seen not abiding by the social distancing you will not be allowed to enter the building.
3. Students will be called one by one for processing and upon entering the building, you will have your temperature taken and asked if you have had any of the symptoms or have been out of town or have attended a large gathering of more than 10 people. The Student's answers will be documented and the student will be given a facemask for the week. Alternatively, you may bring your own facemask if you wish. N95 is not needed.
4. The student will enter the lab and immediately put their belongings in the cubby and immediately proceed to
 - a. wash their hands
 - b. get their lab coat
 - c. go directly to assigned seat given to the student during orientation.
5. Follow the arrows on the floor for proper traffic flow.
6. The student must bring their lunch and eat it in room 135. Microwaves will be valuable for your use. You will not be allowed to leave the building. If the student leaves the building, the student will not be allowed back into the building.
7. Students may only use the restroom facilities located within the CLS student laboratory.
8. Students are not allowed in any other part of the CHS building beyond room 135.

Affective Domain Objectives

To show the appropriate responsible behaviors, students will demonstrate:

1. Educational initiative, self-motivation and a positive attitude by coming prepared to labs as demonstrated by reading ahead and knowing what procedures and how procedures will be performed.
2. Adaptability and flexibility to change and learning (in contrast to rigidity and narrow-mindedness)
3. Good judgement and exercise emotional intelligence by accepting personal responsibility for consequences of one's own actions.
4. Organization by utilizing time effectively, sequencing and prioritizing tasks for completion with time constraints and maintaining a neat clean work area and clean instrumentation properly.

5. Attention to detail and display a firm commitment to accuracy and precision by documenting data accurately and legibly, utilizing strict overall technique, competent quality control techniques, sound critical thinking skills and strong professional ethics.
6. Problem solving abilities by explaining purpose of each step in diagnosis, interpretation, procedure, recognizing discrepancies in techniques or procedures and repeating necessary lab tests when necessary.
7. Dependability by working independently and responding appropriately to and following directions from faculty.
8. Maturity, stability and self-confidence by handling and approaching stressful and hectic situations calmly and efficiently, performing routine tasks confidently without assistance and maintaining composure, defining and being aware of personal limitations, seeking help when needed and pursuing continuing education independently.
9. Appropriate good communication and team skills by cooperating and communicating effectively with classmates and instructors and displaying courteous, considerate behavior and maintaining an appropriate appearance.
10. Application of ethical principles, integrity and professionalism to laboratory practice 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 UTEP CLS Program.
- 11 Application of the principles of professionalism by demonstrating an attitude of compassion, understanding, cooperation, care, friendliness and encouragement to classmates and faculty
12. Commitment to organizational and professional policies regarding appearance, safety, confidentiality and ethics by following UTEP CLS Program standards.

COURSE OBJECTIVES:

At the end of this course the student should be able to:

1. Explain and demonstrate compliance with universal precautions at all times and display safe techniques in handling and disposal of infectious material according to laboratory protocol.
2. Perform blood collection techniques and correctly identify various anticoagulants that correlate with specific blood/serum analyses.
3. Define and describe pre-analytical, analytical, post-analytical variables; delta checks, accuracy, precision, reproducibility, and reference intervals.
4. Demonstrate proper technique and competently perform and evaluate all manual procedures introduced in this course within the appropriate standard deviation for the procedure 100% of the time.
 - a. RBC count

- b. WBC count
 - c. Platelet count
 - d. Reticulocyte count
 - e. Hemoglobin and Hematocrit
 - f. Sedimentation rates
 - g. Calculate RBC indices
 - h. Blood smear preparation and staining
 - i. Slide Differentials, normal and abnormal
5. Correlate various hematological data and make a preliminary evaluation of the patient's hematologic state, i.e. predict pathophysiological causes of any abnormality.
 6. Evaluate cell histograms
 7. Demonstrate a positive attitude toward hematology and appreciate the value of accurate testing and evaluation in providing the patient and the clinician tools for diagnosis, treatment and prevention of disease.

Note: Refer to each laboratory exercise for specific cognitive, affective and psychomotor objectives

GRADING SCALE

100 – 90	A
89 – 80	B
79 – 75	C
74 – 70	D
Below 70	F

EXAMINATIONS

Differentials (100 = 15% of grade)	15%
Proficiency exams (written & practical)	20%
Midterm Lab Practical (perform CBC)	15%
Midterm written exam	15%
Pre-lab quizzes	10%
Final Lab written exam (comprehensive)	<u>25%</u>
	100%

Hematology Procedure	Minimum number performed with > 25% of automated analyzer value
Handwashing	Demonstrate proper technique
Venipuncture	10
Fingerstick	5
Blood smears	10
Wright's stain	5
Hematocrit	3
Sedimentation rate	3
Red cell counts	3
White cell counts	3
Platelet counts	3
Hemoglobin curve	1
Buffy coat preparations	2
Reticulocyte counts	3
Normal differentials	100
Calculation of red cell indices	10

INSTRUCTIONAL STRATEGIES

This Laboratory course is competency based. The student **MUST** demonstrate their competency to perform the laboratory procedure at the designated level before they can progress to the next laboratory procedure. The separate laboratory procedures will be posted in blackboard. The student is responsible for knowing the procedures and answer all the questions posed in the procedures. **YOU WILL BE TESTED OVER THIS!** You will be given a pre-test on the procedure so it is wise to read the procedures ahead of time as, before the laboratory starts, you will be tested over the procedure, including pre-analytical and analytical factors.

The procedures must be performed within the standard deviation for that particular procedure and to the satisfaction of the instructor. A written exam will also be given for a letter grade (cognitive knowledge). **The final grade for the laboratory procedure will be 50% Practical and 50% written exam. If the student receives a fail grade on the laboratory procedure, the student must repeat the procedure until the student is deemed competent. If a student must repeat the procedure, the highest grade the student will earn is a 75% even if the student's proficiency is at a 100% confidence interval.** Due to COVID 19 pandemic, **THERE WILL BE NO MAKE UP LABS.** The student must take the initiative in this laboratory and see that EVERYTHING IS LEARNED, COMPLETED, AND TURNED IN ON TIME.

Internet is NOT always a reliable resource to find answers to the objectives! Be careful!
If you have questions, ASK ME!!!!

The laboratory procedure will be demonstrated on one day and student is usually expected to be proficient by the next scheduled laboratory. With this in mind, absences are not tolerated unless extenuating circumstances occur.

Practical grade determined as below:

- +/- 5% of automated analyzer value = 100%
- +/- 10% of automated analyzer value = 90%
- +/- 20% of automated analyzer value = 80%
- +/- 25% of automated analyzer value = 75%
- < 25% of automated analyzer value **not acceptable performance**, need to repeat the procedure)

Final grade for practical determined as below

50% X Practical Grade + 50% X Exam Grade = **final practical grade**

Differentials: The student must perform 100 differentials by December 4, 2020. Each Friday beginning October 30th, the student is required to turn in his/her differential log. The student will receive a zero for the week if the differential log is not turned in weekly on the following dates: **Oct 30, November 6, 13, 20, 25 (Wednesday).**

You will be slow counting in the beginning but will be able to perform faster as you practice. You may also perform a differential count in other labs **ONLY IF THE LABORATORY INSTRUCTOR GIVES YOU PERMISISON TO DO SO. You may not perform a differential count while performing other lab procedures in chemistry, body fluids, or serology.**

Deadline for 100 differentials will be Dec 4th

Place differentials in designated folder in lab by 4:00 p.m.
NO Exceptions!

**TENTATIVE HEMATOLOGY LABORATORY SCHEDULE
FALL 2020 – May change due to COVID 19**

Dates	LAB (chapters 1-5, 14-16)
Aug 24 & 25 Lab A Aug 26 – 27 Lab B	Venipuncture and microscope use, Pre-analytical, analytical, post analytical variable in the hematology laboratory, Hematocrit and Sedimentation rate, begin blood smears/stain,
Aug 31 7 Spet 1 Lab A Sept 2 & 3 Lab B	Red Blood Cell counts and proficiency Red Blood Cell counts and proficiency
Sept 7 Lab A Sept 8 Lab A Sept 9 & 10 Lab B	Labor day, no classes On-line assignment Due Sept 10 th / Automation, buffy coats / stains On-line assignment Due Sept 10 th / Automation, buffy coats / stains
Sept 14 & 15 Lab A Sept 16 & 17 Lab B	White Blood Cell counts and proficiency White Blood Cell counts and proficiency
Sept 21 & 22 Lab A Sept 23 & 24 Lsb B	Platelet counts and proficiency Platelet counts and proficiency
Sep 28 & 29 Lab A Sep 30 & Oct 1 Lab B	Hemoglobin curve and RBC indices and proficiency Hemoglobin curve and RBC indices and proficiency
Oct 5 & 6 Lab A Oct 7 & 8 Lab B	Written Venipuncture exam & smears (Proficiency is 10 successful) Written Venipuncture exam & smears (Proficiency is 10 successful)
Oct 12 & 13 Lab A Oct 14 & 15 Lab B	Retic counts & Retic Proficiency Retic counts & Retic Proficiency
Oct 19 Lab A Oct 20 Lab A	<i>Midterm Practical exam: CBC and indices – no retics</i> <i>Midterm written exam</i>
Oct 21 Lab B Oct 22 Lab B	<i>Midterm Practical exam: CBC and indices – no retics</i> <i>Midterm written exam</i>
Oct 26 and 27 Lab A Oct 28 and 29 Lab B	Normal Differentials Normal Differentials
Nov 2 and 3 Lab A Nov 4 and 5 Lab B	Normal Differentials Normal Differentials
Nov 9 & 10 Lab A Nov 11 & 12 Lab B	Normal Differentials Normal differentials

Nov 16 & 17 Lab A Normal Differentials
Nov 18 & 19 Lab B Normal Differentials

Nov 23 & 24 Lab A Differentials
Nov 25 Lab B Differentials

Nov 26 Lab B Thanksgiving - NO CLASS

Nov 30 Lab A Differential proficiency & written exam (differentials count toward the 100)
Dec 2 Lab B Differential proficiency & written exam (differentials count toward the 100)

Dec 1 Lab A *Written Comprehensive Final Exam*

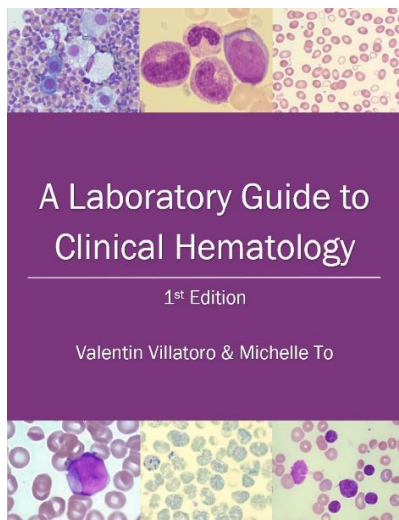
Dec 3 Lab B *Written Comprehensive Final Exam*

Note that Lab B will be short 1 day for differentials. Please make sure you accommodate for

How to succeed in Hematology lab.

1. Read all the procedure **BEFORE** scheduled laboratory.
2. Look up in your book anything associated with the lab procedure and **READ BEFORE** lab
3. Read and answer the TPO questions or assignments associated with the laboratory procedure
4. Write down any questions you may have and bring them to class
5. Perform your hematology procedure at least 2- 3 times

This is a free open access book available for you to use. It may be helpful for you.



<https://openeducationalberta.ca/mlsci/>

SAFETY RULES FOR LABORATORY WORKERS

Protect yourself from infection. Follow these precautions recommended by the U.S. Centers for Disease Control:

1. Avoid contaminating the outside of containers during specimen collection. The lids should be tight. (Enclose specimen in a second container such as a sealed bag when transferring to a reference lab.)
2. Wear vinyl or latex gloves when processing specimens, especially if you are fairly new at the job, or have any cuts or scratches on your hands. Dispose of, rather than disinfect, gloves after use.
3. No mouth pipetting.
4. Use precautions when handling needles. No bending, breaking, recapping, or removing needles from disposable syringes. Place in puncture-resistant containers.
5. Use masks and eye wear if splashing or aerosolization is anticipated. (A tube in a centrifuge could cause this.)
6. Use biological safety cabinets for blending, sonicating and vigorous mixing.
7. Decontaminate work surfaces with a chemical germicide after spills and when work is completed. (A one to ten dilution of household bleach is effective.)
8. Dispose of contaminated materials in bags and in accordance with institutional policies for disposal of infective waste.
9. Decontaminate equipment before repair or shipping.
10. Wash hands and remove protective clothing before leaving laboratory.

Ref: CDC Morbidity and Mortality Weekly Report, 6/24/88. "Update: Universal Precautions for Prevention of Transmission of Human Immunodeficiency Virus, Hepatitis B virus, and other Bloodborne Pathogens in Health-Care Settings," as well as "Recommendations for Prevention of HIV Transmission in Health-Care Settings." Available through the National AIDS Information Clearinghouse, PO Box 6003, Rockville, MD 20850.