

UTEP
Clinical Laboratory Science

Hematology Lab

CLSC 3257



UTEP
HEMATOLOGY

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
Monday and Wednesday 1:00 – 4:00 p.m.

CLS Laboratory Scrubs will be worn by the students when attending laboratory. Masks, at this time are not mandatory but encourage you to wear one. The mandatory status may change as the University continues to monitor the SARS CoV-2 situation.

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

OFFICE College of Health Sciences (CHS) Room 423
Phone: 747-7282
e-mail: lorit@utep.edu

OFFICE HOURS: **Best time** for me to answer questions or concerns is during lab or after lab, OR
Tuesday: 3:00 – 4:00 p.m.
Thursday: 10:00 – 11:00 p.m.
Friday: 10:00 – 12:00 a.m.

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:

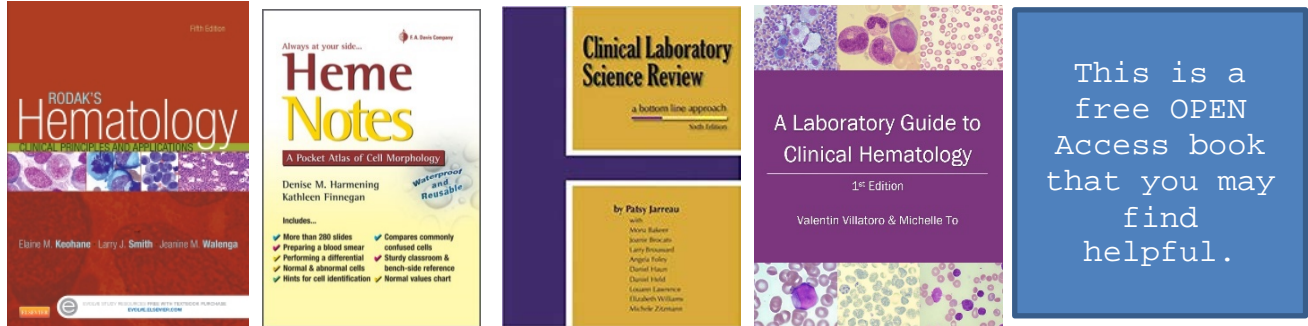
This course is designed to develop the skills and techniques necessary to recognize and identify normal and abnormal components of the hematopoietic system. This course involves the study of maturation, morphology and function of blood cells and their role in disease processes. Emphasis is placed on 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 be 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.

Be advised that if any student comes down with SARS CoV-2 infection, the CLS Laboratories, at the request of the University, might be cancelled and the students will receive an incomplete if all scheduled labs are not completed by the end of the fall 2021 semester.

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

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. WBC count
 - b. Platelet count
 - c. Reticulocyte count
 - d. Hemoglobin and Hematocrit
 - e. Sedimentation rates
 - f. Calculate RBC indices
 - g. Blood smear preparation and staining
 - h. 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 by adhering to the affective domain objectives.

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 (50% written 50% 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 successful video documented
Fingerstick	5
Blood smears	10
Wright's stain	5
Hematocrit	3
Sedimentation rate	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 reference ranges, 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.** 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 the exception of the venipuncture, which the student has the semester to record 10 successful blood collection procedures. With this in mind, absences are not tolerated unless extenuating circumstances occur.

How is my practical grade determined?

+/- 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)

How is my final grade for practical determined?

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

Differentials: The student must perform 100 differentials by December 2, 2022. Each Friday beginning October 28th, 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 28, November 4, 11, 18, 23 (Wednesday) Dec 23rd last day to have 100 completed.**

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 PERMISSION 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 2nd

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

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 performance objective 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**

Tentative Hematology Laboratory Schedule

WEEK 1

Aug 22

Aug 24

Procedure

Venipuncture, finger stick, microscope use, Pre-analytical, analytical, post analytical variable in the hematology laboratory,

WEEK 2

Aug 29

Aug 31

Procedure

Hematocrit and Sedimentation rate, begin blood smears/stain, HCT and SED rate proficiency – not smears yet

WEEK 3

Sept 5

Sept 7

Procedure

Labor day, no classes

Begin White Blood Cell (WBC) counts

WEEK 4

Sept 12

Sept 14

Procedure

WBC count practice

WBC count proficiency

WEEK 5

Sept 19

Sept 21

Procedure

Platelet counts

Platelet counts proficiency

WEEK 6

Sept 26

Sept 28

Procedure

Hemoglobin curve and RBC indices, automation

Hemoglobin curve and RBC indices proficiency

WEEK 7

Oct 3

Oct 5

Prodcedure

Midterm written exam: CBC and indices

Midterm practical exam: CBC and indices

WEEK 8

Oct 10

Oct 12

Procedure

Retic counts

Retic counts Proficiency

WEEK 9

Oct 17

Oct 19

Procedure

Written Venipuncture exam & smears (Proficiency is the 10 successful videos)

Normal Differentials, what is a buffy coat, wright stain

WEEKS 10 – 14

Oct 24 - Nov 23

Procedure

Normal Differentials

WEEK 15

Nov 28

Procedure

Normal Differential proficiency & written exam
(diffs on proficiency may count toward the 100)

NOV 30

Written Comprehensive Final Exam

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 Box6003, Rockville, MD 20850.