

El Paso Community College
Syllabus
Part II
Official Course Description

SUBJECT AREA	<u>Medical Laboratory Technology</u>
COURSE RUBRIC AND NUMBER	<u>MLAB 1227</u>
COURSE TITLE	<u>Coagulation</u>
COURSE CREDIT HOURS	<u>2 2 : 1</u> Credits Lec Lab

I. Catalog Description

Provides a course in coagulation theory, procedures and practical applications. Includes quality control, quality assurance, lab safety and laboratory procedures which rely on commonly performed manual and/or semi-automated methods. A grade of "C" or better is required in this course to take the next course.

Corequisite: MLAB 1260. (2:1). Lab fee.

II. Course Objectives

A. Unit I. Lab Operations and Laboratory Safety

Upon satisfactory completion of this unit, the student will be able to:

1. Adhere to HIPAA protocols when communicating via telephone, facsimile, E-mail, or performing Delta Checks.
2. Demonstrate adherence to Standard Precautions and the organizations' SOP (Standard Operating Procedures) at all times.
3. Compliance with government, state, and organizational safety regulations involving Biological, Chemical, Radioactive, Fire, Physical, and Electrical hazards.
4. Explain the word "STAT" in relation to turnout time for sample collection, test performance, and test reporting.
5. List the types of body fluids studied in the coagulation department and identify their source.
6. Explain the importance of actively participating in Quality Assurance, Quality Control and Proficiency Testing protocols incorporating precision, accuracy, Levey Jennings Charts and Westgard Rules.
7. Locate and make use of MSDS (Material Safety Data Sheets)
8. Demonstrate knowledge, skills, and ability to perform basic venous blood collection procedures for coagulation studies.
9. Discuss nosocomial infections and identify the basic programs for infection control.
10. Identify the potential routes of infection and methods for preventing transmission of microorganisms through these routes.
11. Explain the proper techniques for hand washing, gowning, gloving, and masking.
12. Compare and contrast the different blood collection biohazard containers used to dispose of contaminated materials.

B. Unit II Coagulation and Hemostasis

Upon satisfactory completion of this unit, the student will be able to:

1. Present the basic theoretical concepts of hemostasis.
2. Outline the general process of hemostasis in small vessels that contribute to the maintenance of vascular integrity.

3. Describe and compare the histological features of the tissues of the arteries and veins.
 4. Explain the importance of accurate patient blood collection sampling for coagulation studies to include:
 - a. Tourniquet placement and duration
 - b. Specific evacuated blood collection tube and its additive
 - c. 9:1 ratio
 - d. Tissue thromboplastin contamination
 - e. Use of Winged Infusion Sets
 - f. Tube fill rate
 - g. Medication dosage based on lab results
 5. Explain the role of tissue thromboplastin in activating coagulation.
 6. Describe hemolysis and explain its effect if photometric testing is performed.
- C. Unit III. Blood Vasculature Structure, Function and the Megakaryocyte
Upon satisfactory completion of this unit, the student will be able to:
1. Identify a megakaryocyte and describe its function.
 2. Describe the morphological features of the mature stages of development in the megakaryocyte series and the role platelets play in coagulation.
 3. Explain the hemostasis process.
 4. Discuss the formation of a clot and scab.
 5. Describe fibrinolysis.
 6. Describe the interactions between the vasculature, platelets, coagulation factors and the fibrinolytic system in maintaining hemostasis.
 7. Define the term vasoconstriction.
 8. Explain how vasoconstriction participates in hemostasis.
 9. Outline the general process of hemostasis in small vessels that contributes to the maintenance of vascular integrity.
 10. Describe the process of formation of platelets from a megakaryocyte.
- D. Unit IV. Blood Coagulation Factors, Thrombosis, and Laboratory Assessment.
Upon satisfactory completion of this unit, the student will be able to:
1. List nine sources of error in coagulation testing.
 2. List the principle coagulation factors involved the intrinsic and extrinsic coagulation cascade.
 3. Describe the sequence of sequence of events in the intrinsic pathway.
 4. Discuss hemostatic abnormalities and identify the various laboratory testing methodologies used to identify these clinical hemostasis disorders.
 5. Identify five coagulation factors that if deficient, result in abnormal APTT but which can be corrected by fresh normal plasma.
 6. Identify the effect of Factor I, II, V, VII, VIII, IX, X, XI, AND XII deficiencies on PT and APTT.
 7. Describe the significance and/or role of the following coagulation tests:
 - a. Bleeding time
 - b. Clot Retraction
 - c. Platelet Aggregation
 - d. Prothrombin time (PT)
 - e. PT-INR (Prothrombin Time- International Normalized Ratio)
 - f. Activated Partial Thromboplastin Time (APTT)
 - g. Activated Coagulation Time
 - h. Thrombin Clotting Time (Thrombin Clotting Time (TCT)
 - i. Fibrinogen
 - j. D-Dimer
 - k. Mixing studies
 - l. Low Molecular Weight heparin
- E. Unit V. Vascular, Platelet, and Coagulation Factor Disorders
Upon satisfactory completion of this unit, the student will be able to:

1. Define the term purpura and describe various vascular conditions that can produce this condition.
2. Name and compare four types of disorders in which abnormal platelet morphology can be observed.
3. List three major mechanisms that produce thrombocytopenia.
4. Identify the coagulation factors that are affected by:
 - a. Liver disease (II, VII, IX, X, V, VII, I)
 - b. Vitamin K deficiency (II, VII, IX, X)
 - c. Coumadin therapy (II, VII, IX, X)
 - d. Disseminated intravascular coagulation (I, II, V, VIII, and Platelets)
 - e. Primary fibrinolysis (I, V, VIII)
5. Describe the functions of protein C and protein S.
6. Explain qualitative and quantitative platelet disorders that affect coagulation.
7. Explain how coagulation factor disorders or deficiencies can affect normal coagulation function.
8. Explain Disseminated Intravascular Coagulation and the lab tests that are involved.

III. THECB Learning Outcomes (WECM)

1. Apply principles of safety, quality assurance and quality control in coagulation.
2. Evaluate specimen acceptability.
3. Compare and contrast coagulation processes under normal and abnormal human conditions.
4. Perform basic laboratory coagulation analysis.
5. Evaluate laboratory test results and correlate with patient condition(s).

IV. Evaluation

A. Preassessment

Students should have successfully completed the specialized Admissions process to enter the Medical Laboratory Technology Program. Prerequisites and/or Corequisites may be required for MLAB courses.

B. Postassessment

1. Quizzes, lecture exams, and a final comprehensive written examination will be used to assess students' competency in didactic objectives.
2. Lab competency exams and lab practical exams are used to assess students' achievement of psychomotor objectives.
3. Lab practical exams require students to demonstrate a particular skill learned in the lab component of the class.
4. Written unit exams will consist of the following question types: multiple-choice, completion, essay, matching, spelling, analysis, and definition or any combination of these.

C. Final Examination

A comprehensive Final Exam is scheduled for this course.

D. Evaluation

To evaluate students' achievement of course objectives, student grades are tabulated using a final grade break down sheet. To successfully complete MLAB1227 Coagulation, the student must achieve at least a 70% in course components. The students overall grade must be no less than "C" to be allowed to progress to the next program level.

E. Remediation

If a student scores less than 70% on any exam, the instructor will encourage the student to conference with the instructor or tutor, to review problem areas. Different learning and studying techniques will be discussed.

F. Grading

Grading Scale used in calculating students' final grade for MLAB 1227 Coagulation.

<u>Evaluation Tools</u>	<u>% Value</u>	<u>Grading Scale</u>
Quizzes	20%	A = 90 -100%
Lecture Exam I	25%	B = 80 - 89%
Lecture Exam II	25%	C = 70 - 79%
Comprehensive Exam	<u>30%</u>	D = 60 - 69%
	100%	F = 59% and below

(Coagulation Lab is on a Pass/Fail bases. Laboratories will be graded on a Pass/Fail system based on the competency limits set by the program for each individual procedure. An average of 80% is required to pass the laboratory portion of MLAB 1227 Coagulation)

Each grade will initially be determined in decimals to the tenths. The final grade however, will only be recorded as a whole number. The guide used will be to round 0.1 through 0.4 to the lower whole number, and 0.5 through 0.9 are raised to next whole number. Example: If at the end of the course a student earns 87.4; the grade will be reflected as 87%. If the student earns 87.6 the grade is rounded to 88%. No decimals will be shown on the final grade scanners.

V. Disability Statement (American with/Disabilities Act [ADA])

EPCC offers a variety of services to persons with documented sensory, mental, physical, or temporary disabling conditions to promote success in classes. If you have a disability and believe you may need services, you are encouraged to contact the Center for Students with Disabilities to discuss your needs with a counselor. All discussions and documentation are kept confidential. Offices located: VV Rm C-112 (831-2426); TM Rm 1400 (831-5808); RG Rm B-201 (831-4198); NWC Rm M-54 (831-8815); and MDP Rm A-125 (831-7024).

VI. 6 Drop Rule

Students who began attending Texas public institutions of higher education for the first time during the Fall 2007 semester or later are subject to a 6-Drop limit for all undergraduate classes. Developmental, ESL, Dual Credit and Early College High School classes are exempt from this rule. All students should consult with their instructor before dropping a class. Academic assistance is available. Students are encouraged to see Counseling Services if dropping because exemptions may apply. Refer to the EPCC catalog and website for additional information.