Course Syllabus

What you will learn in this course

Medical Lab Assisting 2a: Blood and Point of Care Testing

It's time to roll up your sleeves—and your patient's sleeves, too— and dig into phlebotomy even deeper. In this course, you will explore advanced phlebotomy techniques, blood disease pathology and testing procedures, and more about blood typing. You'll build on your knowledge of blood cell behavior, counting, and clotting and all about the blood screening process from start to finish. You will also learn about lifespan considerations, troubleshoot issues common to the MLA, and expand your knowledge of point-of-care testing and reporting values. Now push those sleeves up high, and let's get started!

Unit 1: Specialty Lab Procedures

Congratulations! You are on your way to becoming a medical laboratory assistant! You have spent time reading and learning the basic principles of how the medical laboratory works. There is still much to

learn from acquiring advanced phlebotomy techniques, troubleshooting challenges to specimen collection, and reasoning through testing results. Now it is time to roll up your sleeves, pull on your gloves, and put the concepts you have spent hours learning to use!

What will you learn in this unit?

After studying this unit, you will be able to:

1. Explain advanced phlebotomy concepts including the use of the butterfly needle and the risks of drawing too much blood
2. Detail the steps of capillary puncture and collection
3. Summarize pediatric punctures and troubleshoot difficult capillary punctures
4. Identify precautions when working with infectious agents
5. Describe the phases of the diagnostic testing process

Unit 1 Assignments	
Assignments	**Type**
Lesson 01: Additional Phlebotomy Procedures	Lesson
Lesson 02: Capillary Puncture and Collection	Lesson
Lesson 03: Advanced Capillary Puncture Technique	Lesson
Lesson 04: Proper Handling of Infectious Materials	Lesson
Lesson 05: Steps in Laboratory Assessments	Lesson
Critical Thinking Questions	Submission
Activity 1: How Do I Demonstrate Thermometer Accuracy?	Submission
Activity 2: Is My Thermometer Accurate?	Submission
Cumulative Project 1: How Do You Teach Safe Work Practices?	Submission
Activity 3: How Do You Calm a Pediatric Parent?	Submission
Unit 1 Discussion 1	Discussion
Unit 1 Discussion 2	Discussion
Unit 1 Quiz	Multiple Choice

Unit 2: Point-of-Care Testing

Imagine this: Before you is a test kit. The contents of this simple sealed package represent the culmination of laboratory knowledge and technology. Scaled-down, refined, and simplified, point-of-care testing allows expanded access to testing once only available in large medical laboratories. Knowing how to safely and reliably wield the power at your fingertips takes practice, focus, and critical thinking. The rewards are extensive for both the MLA and the patient, so let's explore in-depth the world of point-of-care testing!

What will you learn in this unit?

After studying this unit, you will be able to:

1. Identify common point of care tests, their characteristics, and disadvantages
2. Explain internal versus external quality controls including lot-to-lot correlations
3. Summarize principles behind and steps involved with point-of-care testing
4. Discuss troubleshooting procedures for point-of-care testing and sample collection

Unit 2 Assignments	
Assignments	**Type**
Lesson 01: Point-of-Care Testing (POCT) Characteristics	Lesson
Lesson 02: POCT Quality Controls	Lesson
Lesson 03: Proper Use of POCT	Lesson
Lesson 04: Maintaining POCT Integrity	Lesson
Critical Thinking Questions	Submission
Activity 1: When Do You Use Quality Controls?	Submission
Cumulative Project 2: How Can I Compare Different Types of POCT?	Submission
Activity 2: How Do You Teach Performance of a POCT?	Submission
Activity 3: How Do You Teach Accurate Testing Technique?	Submission
Unit 2 Discussion 1	Discussion
Unit 2 Discussion 2	Discussion
Unit 2 Quiz	Multiple Choice

Unit 3: Principles of Blood Diseases

What could be worse than your blood no longer working? Imagine if the fluid that keeps you healthy is no longer healthy. Diseases of the blood can affect any of the formed elements, which can spell disaster for the rest of the body. A good understanding of how these diseases manifest is the first step in knowing how we can test for them. Are you ready for another trip down the blood line?

What will you learn in this unit?

After studying this unit, you will be able to:

1. Identify disease terminology and principles
2. Describe hematopoiesis and red blood cell indices
3. Explain the different classifications of leukocytes and the leukocyte differential
4. Summarize the coagulation process and the causes of clotting disorders

Unit 3 Assignments	
Assignments	**Type**
Lesson 01: Disease: What Is It?	Lesson
Lesson 02: Red Blood Cell Indices	Lesson
Lesson 03: Principles of Diseased Leukocytes	Lesson
Lesson 04: Blood Clotting Abnormalities	Lesson
Critical Thinking Questions	Submission
Activity 1: How Can I Communicate Hematology Terminology?	Submission
Activity 2: Can Learning About Coagulation Be Fun?	Submission
Cumulative Project 3: Is This Cell All Right?	Submission
Activity 3: What Have I Learned So Far?	Submission
Unit 3 Discussion 1	Discussion
Unit 3 Discussion 2	Discussion
Unit 3 Quiz	Multiple Choice

Unit 4: Blood Counts and ESR

Can you count to a trillion? If there was a shortcut, would you want to learn it? Counting the trillions of cells in the blood could take a lifetime; fortunately, the medical lab has developed technology that speeds this up tremendously. Now it's time to combine your background in hematology with this technology and some new techniques. Knowledge really can get the blood pumping; you can count on it!

What will you learn in this unit?

After studying this unit, you will be able to:

1. Identify the tests and equipment used in the complete blood count
2. Describe the methods used for automated and manual cell counts
3. Explain the steps of manual RBC and WBC counting
4. Summarize the principles and performance of erythrocyte sedimentation rate (ESR)

Unit 4 Assignments	
Assignments	**Type**
Lesson 01: It's What's in it That Counts	Lesson
Lesson 02: Automated and Manual Counting	Lesson
Lesson 03: White and Red Blood Cell Counts	Lesson
Lesson 04: Erythrocyte Sedimentation Rate	Lesson
Critical Thinking Questions	Submission
Activity 1: Why Do Mixtures Separate?	Submission
Activity 2: How Can You Measure an ESR Rate?	Submission
Cumulative Project 4: How Do You Teach Performance of a Blood Count Procedure?	Submission
Activity 3: How Can I Best Communicate with a Patient?	Submission
Unit 4 Discussion 1	Discussion
Unit 4 Discussion 2	Discussion
Unit 4 Quiz	Multiple Choice

Midterm Exam

1. Review information acquired and mastered from this course up to this point.
2. Take a course exam based on material from the **first half** of the course (**Note:** You will be able to open this exam only one time.)

Midterm Exam Assignments	
Assignment	**Type**
Midterm Exam	Multiple Choice
Midterm Discussion	Discussion

Unit 5: Testing for Anemia and Clotting

Do numbers tell a story? What about a blood cell? From anemia to altered bleeding, we can learn a lot from digital screens and microscopes. Testing gives us a clearer picture of what we're working with, so diagnosis and treatment can be more finely tuned. Let's take a closer look at anemia and clotting, along with their specific testing and procedures.

What will you learn in this unit?

After studying this unit, you will be able to:

1. Describe hemoglobin testing and quality control procedures
2. Detail the steps of hematocrit testing and calculations
3. Identify different anemia forms, detection methods, and treatments
4. Explain manual platelet counting and bleeding times
5. Summarize platelet function, partial thromboplastin, and prothrombin testing

Unit 5 Assignments	
Assignments	**Type**
Lesson 01: Hemoglobin Testing	Lesson
Lesson 02: Hematocrit Testing	Lesson
Lesson 03: Hematologic Pathology	Lesson
Lesson 04: Platelet Testing	Lesson
Lesson 05: Testing for Clotting	Lesson
Critical Thinking Questions	Submission
Cumulative Project 5: What Is the Best Way to Teach Spun Hematocrit Technique?	Submission
Activity 1: How Do You Teach Point-of-Care Hemoglobin Testing?	Submission
Activity 2: How Can Patients Be Educated on their Blood Conditions?	Submission
Activity 3: What Does Quality Control and Calibration Mean?	Submission
Unit 5 Discussion 1	Discussion
Unit 5 Discussion 2	Discussion
Unit 5 Quiz	Multiple Choice

Unit 6: Blood Typing Principles

A candle disperses its flickering light across the cold damp room, causing a metal tool to glimmer in an ungloved hand. A warning is spoken, and the patient braces themself for what is to come. This scenario gives a hint of what blood transfusions might have been like a few hundred years ago. Organizations involved in oversight and advancements in technology have made what was once a dangerous exercise a common lifesaving process. Let's explore how we got to this point in history and when medical treatments began including blood type.

What will you learn in this unit?

After studying this unit, you will be able to:

1. Detail the different types of blood and their occurrences in the population
2. Summarize the development and principles of the ABO system
3. Explain the Rh system of blood types and its clinical considerations
4. Describe the creation of blood antigens and blood products
5. Identify the blood supply oversight organizations

Unit 6 Assignments	
Assignments	**Type**
Lesson 01: Blood Types Throughout History	Lesson
Lesson 02: The History of the ABO System	Lesson
Lesson 03: The Rh Factor	Lesson
Lesson 04: Blood Products	Lesson
Lesson 05: Oversight of Blood Products	Lesson
Critical Thinking Questions	Submission
Cumulative Project 6: How Do You Teach about Blood Products?	Submission
Activity 1: How Can a Facility Follow Transfusion Standards?	Submission
Activity 2: How is Inheritance Related to Blood Type?	Submission
Activity 3: What Have I Learned So Far?	Submission
Unit 6 Discussion 1	Discussion
Unit 6 Discussion 2	Discussion
Unit 6 Quiz	Multiple Choice

Unit 7: Preparing Blood Products

A patient is rushed into the hospital with a life-threatening emergency. The physician orders a blood transmission to save their life. In these moments of crisis, the medical providers need to be sure the transfusion is safe. Trust in the blood product in the bag is essential to providers. The story of how the product gets from donor to patient could not take place without the personnel of the medical lab. To understand transfusions, you need to start with a unit full of blood.

What will you learn in this unit?

After studying this unit, you will be able to:

1. Summarize blood donor screening and collection procedures
2. Identify blood infections and the clinical importance of antibodies in donations
3. Describe blood typing and leukocyte removal procedures
4. Explain the creation of blood products and their storage procedures
5. Detail crossmatching, storage locations, and the uses of blood products

Unit 7 Assignments	
Assignments	**Type**
Lesson 01: Blood Donation	Lesson
Lesson 02: Processing Procedures	Lesson
Lesson 03: Determining Compatibility	Lesson
Lesson 04: Collection and Storage of Blood Components	Lesson
Lesson 05: Transfusions	Lesson
Critical Thinking Questions	Submission
Cumulative Project 7: How Do You Teach Slide Agglutination Testing?	Submission
Activity 1: What is Donating Blood Like?	Submission
Activity 2: How Is Information Best Visually Expressed?	Submission
Activity 3: Why Do Blood Antibodies Matter?	Submission
Unit 7 Discussion 1	Discussion
Unit 7 Discussion 2	Discussion
Unit 7 Quiz	Multiple Choice

Unit 8: Special Reporting Procedures

The man’s tight lips and furrowed brow convey his emotions. Could this level of tension have manifested from just a few words and numbers on a page? Lab results can be upsetting. Offering the highest level of care is the principle that should guide your interactions with patients and their

providers. Critical thinking and adaptability are requirements for all members of the healthcare team, in any situation. The lab supports the patient's care through timely, accurate, and empathetic collection and reporting of lab results.

What will you learn in this unit?

After studying this unit, you will be able to:

1. Detail the considerations of patient interactions and elements of documentation
2. Identify the criteria for triage and its impact on reporting of test results
3. Explain reporting in the point-of-care setting including critical values
4. Summarize the concepts of mean, median, mode, and confidence intervals
5. Describe autoverification and protocols for reporting and correcting results

Unit 8 Assignments	
Assignments	**Type**
Lesson 01: The Need for Reporting	Lesson
Lesson 02: Reporting Abnormal Values	Lesson
Lesson 03: Reporting POCT Values	Lesson
Lesson 04: The Mathematics of Reporting	Lesson
Lesson 05: Reporting Out	Lesson
Critical Thinking Questions	Submission
Cumulative Project 8: Why is Communication Important?	Submission
Activity 1: How Do I Calculate the Mean, Median, and Mode?	Submission
Activity 2: When is Reporting to Health Agencies Required?	Submission
Activity 3: What Did I Get from This Course?	Submission
Unit 8 Discussion 1	Discussion
Unit 8 Discussion 2	Discussion
Unit 8 Quiz	Multiple Choice

Final Exam

1. Review information acquired and mastered from this course up to this point.
2. Take a course exam based on material from the **second half** of the course (**Note:** You will be able to open this exam only one time.)

Final Exam Assignments	
Assignment	**Type**
Final Exam	Multiple Choice
Final Discussion	Discussion