

**MODESTO JUNIOR COLLEGE
MEDICAL ASSISTING PROGRAM
Syllabus**

Course Number: MDAST 325

Course Title: Medical Assisting Laboratory Procedures

Course Description: Introduction to laboratory procedures necessary to aid the physician. Includes patient preparation for diagnostic studies, purposes, techniques, and recording of procedures commonly performed.

Credit: 3 units

Class Hours: Hybrid Course / 7 hours per week for lab

Instructor: Amy Duffy email: duffya@mjcc.edu
Office: Glacier Hall 124 Phone: (209) 575-6380
Office Hours: Tuesday and Wednesday 9:30 am – 12:00 pm
Students are welcome to email or call for an appointment
Class Location: Lecture-Online Lab-GH207/210

Methods of Instruction: This course will be taught by lecture, collaborative learning experience, guided discussion, audio-visual materials, case studies, computer assignments and demonstration of clinical procedures.

Texts: Niedzwiecki, Pepper, & Weaver (2020). The Medical Assistant (14th ed.). St. Louis, Missouri: Elsevier

Niedzwiecki, Pepper, & Weaver (2020). Study Guide and Procedure Checklist Manual for The Medical Assistant (14th ed.). St. Louis, Missouri: Elsevier

**Minimum
Performance
Standards:**

The student will receive one grade from this course. The requirements for satisfactory completion and minimum performance in this course will be evaluated by the instructor based on the student's:

- I. **Tests, quizzes, class assignments, computer assignments and written assignments.**
- II. **Successful completion of entry-level procedures for the medical assistant.**

The student then has a maximum of three attempts to achieve a satisfactory rating by the instructor for each procedure. **“Achievement of the competencies” means that each student has successfully achieved 100% of the MAERB Core Curriculum psychomotor (skills) and affective (behavior) competencies taught with that course. The student must successfully complete all of the psychomotor (skills) and affective (behavior) competencies in the course.**

Failure to clearly demonstrate any of the Minimum Performance Standards will result in failure of the course.

If the student's performance falls below a “C”, the instructor will require a counseling session with the student and complete a Student Contact Sheet.

If improvement does not take place, the instructor will initiate another meeting with the student and complete a Probation Notice.

If the student's performance remains unsatisfactory, the student will need to repeat the entire course.

Any student required to repeat a medical assisting course will be required to withdraw from the program and reapply to repeat the course the following year.

**Grading
Scale:**

The grading policy requires a grade of “C” or better to progress in the Medical Assisting Program.

**A = 100-90%
B = 89-80%
C = 79-70%
D = 69-60%
F = 59 and below**

A. COURSE GOAL

As a result of satisfactory completion of this course, the student should be prepared to:

Discuss the role of the clinical laboratory in patient care and the medical assistant’s role in coordinating laboratory tests and results. Also, compare and contrast the agencies that govern or influence practice in the clinical laboratory. Additionally, summarize techniques to minimize physical, chemical and biological risks in the clinical laboratory.

B. STUDENT LEARNING GOALS

Mastery of the following learning goals will enable the student to achieve the overall course goal.

Required Learning Goals

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

- a. Develop basic skills in operation and care of the microscope.
- b. Schedule appointment for lab tests.
- c. Instruct patient in preparation for diagnostic procedures.
- d. Obtain, prepare, label and handle specimens to be sent for analysis.
- e. Complete lab requisition forms.
- f. Define and identify the normal range of laboratory tests.
- g. Perform routine diagnostic tests under the direction of a physician.
- h. File lab reports in a patient’s medical record.
- i. Maintain laboratory supplies and equipment.

COURSE LEARNING OUTCOMES

Upon satisfactory completion of this course. The student should be prepared to:

1. Perform blood chemistry procedures including capillary punctures.
2. Demonstrate the proper techniques for urine collection and urinalysis procedures.

CHAPTER 26 Principles of Electrocardiography

PREPARATION:

**Read Chapter 26 in The Medical Assistant
Complete Chapter 26 in the Study Guide and Procedure Checklist Manual**

CONTENT:

This chapter covers the electrical conduction activity of the heart and the procedure of the electrocardiogram.

LEARNING OBJECTIVES:

1. Review the structures and functionality of the cardiovascular system.
2. Use correct electrocardiography (ECG) terminology.
3. Discuss ECG waves, segments, and intervals.
4. Describe the medical assistant's role in a resting 12-lead ECG.
5. Describe the bipolar (standard) leads, augmented leads, and chest (precordial) leads.
6. Prepare a patient for an ECG and obtain an electrocardiogram.
7. Troubleshoot artifacts in an ECG.
8. Identify abnormal rhythms in an ECG tracing.
9. Discuss additional ECG tests.

COMPETENCIES:

Cognitive Knowledge:

- II.C.6. Analyze healthcare results as reported in:
 - a. graphs
- V.C.6. Define coaching a patient as it relates to:
 - c. compliance with treatment

Psychomotor Skills:

- I.P.2. Perform:
 - a. electrocardiography
- I.P.8. Instruct and prepare a patient for a procedure or a treatment
- X.P.3. Document patient care accurately in the medical record

Affective Behavior:

- I.A.2. Incorporate critical thinking skills when performing patient care
- I.A.3. Show awareness of a patient's concerns related to the procedure being performed

PROCEDURES:

- 26.1** Perform Electrocardiography
- 26.2** Apply a Holter Monitor

CHAPTER 45 Introduction to the Clinical Laboratory

PREPARATION:

**Read Chapter 45 in The Medical Assistant
Complete Chapter 45 in the Study Guide and Checklist Procedure Manual**

CONTENT:

Laboratory medicine is the medical discipline that applies clinical laboratory science to the care and diagnosis of patients. Patient specimens can be collected at the laboratory or in an ambulatory care facility. A specimen is a sample of body fluid, waste product, or tissue collected for analysis.

LEARNING OBJECTIVES:

1. Discuss the role of the clinical laboratory personnel in patient care and the medical assistant's role in coordinating laboratory tests and results.
2. Describe the divisions/departments of the clinical laboratory.
3. Explain the three regulatory categories established by the Clinical Laboratory Improvement Amendments (CLIA) and identify CLIA-waived tests associated with common diseases.
4. Identify quality assurance practices in healthcare, document the results on a laboratory flow sheet, and discuss quality control guidelines.
5. Discuss laboratory safety and the governing agencies involved in safety standards.
6. Discuss the purpose of a Safety Data Sheet (SDS), and summarize safety techniques to minimize physical, chemical, and biologic hazards in the clinical laboratory.
7. Describe the essential elements of a laboratory requisition.
8. Discuss specimen collection, including the importance of sensitivity to patient's rights and feelings when collecting specimens. Also, discuss the eight steps to follow when collecting specimens and informing patients of their results.
9. Explain the chain of custody and why it is important.
10. Discuss the measurement of time and temperature, and name the metric units used for measuring liquid volume, distance, and mass.

11. Name the parts of a microscope, and describe their functions. Also, summarize selected microscopy tests that may be performed in the ambulatory care setting.
12. Describe the safe use of a centrifuge.
13. Discuss the use of an incubator.

COMPETENCIES:

Cognitive Knowledge:

- I.C.10. Identify CLIA waived tests associated with common diseases
- I.C.12. Identify quality assurance practices in healthcare
- II.C.6. Analyze healthcare results as reported in
 - b. tables
- III.C.4. Identify methods of controlling the growth of microorganisms
- VI.C.9. Explain the purpose of routine maintenance of administrative and clinical equipment
- XII.C.1. Identify:
 - a. safety symbols
 - b. symbols
 - c. labels
- XII.C.2. Identify safety techniques that can be used in responding to accidental exposure to:
 - a. blood
 - b. other body fluids
 - c. needlesticks
 - d. chemicals
- XII.C.5. Describe the purpose of Safety Data Sheets (SDS) in a healthcare Setting

Psychomotor Skills:

- I.P.10. Perform a quality control measure
- II.P.3. Maintain laboratory test results using flow sheets
- III.P.2. Select appropriate barrier/personal protective equipment (PPE)
- VI.P.8. Perform routine maintenance of administrative or clinical equipment
- XII.P.1. Comply with:
 - a. safety signs
 - b. symbols
 - c. labels
- XII.P.2. Demonstrate proper use of:
 - a. eyewash equipment
- XII.P.5. Evaluate the work environment to identify unsafe working conditions

PROCEDURES:

- 45.1** Perform a Quality Control Measure on a Glucometer and Record the Results on a Flow Sheet.
- 45.2** Use of the Eyewash Equipment: Perform an Emergency Eye Wash
- 45.3** Evaluate the Laboratory Environment
- 45.4** Perform Routine Maintenance on Clinical Equipment (Microscope)

CHAPTER 46 Urinalysis

PREPARATION:

**Read Chapter 46 in The Medical Assistant
Complete Chapter 46 in the Study Guide and Procedure Checklist Manual**

CONTENT:

This chapter will prepare the medical assistant for performance of routine urinalysis. The student will obtain knowledge of the physiology of urine production as well as tests related to urinalysis.

LEARNING OBJECTIVES:

1. Describe the anatomy and physiology of the urinary tract and discuss formation and elimination of urine.
2. Show sensitivity to patient's rights and feelings when collecting specimens. Also, discuss collection containers, and instruct a patient on the collection of a 24-hour urine specimen.
3. Explain various means and methods used to collect urine specimens. Also, instruct a patient on the collection of a clean-catch midstream urine specimen.
4. Discuss handling and transporting specimens.
5. Complete the following related to the physical examination of urine:
 - Examine and report the physical aspects of urine.
 - Assess urine for color and turbidity.
 - Perform quality control measures and differentiate between normal and abnormal results while determining the reliability of chemical reagent strips.
6. Examine and report on the chemical aspects of urine, and test urine with chemical reagent strips.
7. Discuss the limitations of reagent strip testing and explain quality control and quality assurance related to urinalysis.
8. Prepare a urine specimen for microscopic evaluation, and understand the significance of casts, cells, crystals, and miscellaneous findings in the microscopy report.

9. Explain or perform the following CLIA-waived urine tests:
 - Glucose testing using the Clinitest method
 - Urine pregnancy test
 - Ovulation and menopause tests
 - Urine toxicology and drug tests

10. List the means by which urine could be adulterated before drug testing and discuss chain of custody rules for drug testing.

COMPETENCIES:

Cognitive Knowledge:

- I.C.10. Identify CLIA waived tests associated with common diseases
- II.C.6. Analyze healthcare results as reported in:
 - b. tables

Psychomotor Skills:

- I.P.8. Instruct and prepare a patient for a procedure treatment
- I.P.10. Perform a quality control measure
- I.P.11. Obtain specimens and perform:
 - a. CLIA-waived urinalysis
 - b. CLIA waived chemistry test
 - c. CLIA waived urinalysis
 - d. CLIA waived immunology test
 - e. CLIA waived microbiology test
- II.P.2. Differentiate between normal and abnormal test results
- III.P.2. Select appropriate barrier/personal protective equipment (PPE)
- III.P.10. Demonstrate proper disposal of biohazardous material:
 - a. sharps
 - b. regulated wastes
- X.P.3. Document patient care accurately in the medical record

Affective Behavior:

- II.A.1. Reassure a patient of the accuracy of the test results

PROCEDURES:

- 46.1** Instruct a Patient in the Collection of a 24-Hour Urine Specimen
- 46.2** Collect a Clean-Catch Midstream Urine Specimen
- 46.3** Assess Urine for Color and Turbidity: Physical Test
- 46.4** Perform Quality Control Measures: Differentiate Between Normal and Abnormal Test Results While Determining the Reliability of Chemical Reagent Strips
- 46.5** Test Urine with Chemical Reagent Strips
- 46.6** Prepare a Urine Specimen for Microscopic Examination
- 46.8** Perform a CLIA-Waived Urinalysis: Perform a Pregnancy Test
- 46.9** Reassure a Patient of the Accuracy of the Test Results

PREPARATION:

**Read Chapter 47 in The Medical Assistant
Complete Chapter 47 in the Study Guide and Procedure Checklist Manual**

CONTENT:

This chapter instructs the medical assisting student in the various methods of blood collection by venipuncture, as well as safety precautions and procedures regarding phlebotomy.

LEARNING OBJECTIVES:

1. Discuss venipuncture equipment and personal protective equipment. Also, explain the purpose of a tourniquet, how to apply it, and the consequences of improper tourniquet application.
2. Discuss antiseptic, explain why the stopper colors on vacuum tubes differ, and state the correct color order of the draw.
3. Discuss the needles and supplies used in phlebotomy.
4. Discuss needle safety and postexposure needlestick follow-up.
5. Complete the following related to routine venipuncture
 - Discuss patient preparation for routine venipuncture
 - List in order the steps of a routine venipuncture
 - Detail patient preparation for venipuncture that shows sensitivity to the patient's rights and feelings
 - Perform a venipuncture using the vacuum tube method, syringe, and winged-infusion (butterfly) assembly
6. Discuss possible solutions to venipuncture complications.
7. List situations in which capillary puncture would be preferred over venipuncture, and discuss the equipment used.
8. Perform a capillary puncture.

9. Discuss pediatric phlebotomy, including typical childhood behavior and parental involvement during phlebotomy, and general guidelines for pediatric venipuncture.
10. Describe handling and transport methods for blood after collection.

COMPETENCIES:

Psychomotor Skills:

- | | |
|-----------|--|
| I.P.2. | Perform: |
| | b. venipuncture |
| I.P.8. | Instruct and prepare a patient for a procedure treatment |
| I.P.11. | Obtain specimens and perform: |
| | a. CLIA-waived urinalysis |
| | b. CLIA waived chemistry test |
| | c. CLIA waived urinalysis |
| | d. CLIA waived immunology test |
| | e. CLIA waived microbiology test |
| III.P.2. | Select appropriate barrier/personal protective equipment (PPE) |
| III.P.10. | Demonstrate proper disposal of biohazardous material: |
| | a. sharps |
| | b. regulated wastes |
| XII.P.2. | Demonstrate proper use of: |
| | a. sharps disposal containers |

Affective Behavior:

- | | |
|--------|---|
| I.A.2. | Incorporate critical thinking skills when performing patient care |
| I.A.3. | Show awareness of a patient's concerns related to the procedure being performed |

PROCEDURES:

- 47.1** Perform a Venipuncture: Collect a Venous Blood Sample Using the Vacuum Tube Method
- 47.2** Perform a Venipuncture: Collect a Venous Blood Sample Using the Syringe Method
- 47.3** Perform a Venipuncture: Obtain a Venous Sample with a Safety Winged Butterfly Needle Assembly
- 47.4** Perform a Capillary Puncture: Obtain a Blood Sample by Capillary Puncture
- 47.5** Show Awareness of a Patient's Concern Related to a Procedure

PREPARATION:

**Read Chapter 48 in The Medical Assistant
Complete Chapter 48 in the Study Guide and Procedure Checklist Manual**

CONTENT:

This chapter instructs the medical assisting student in the various types of blood cells and the diagnostic purposes of examination of blood.

LEARNING OBJECTIVES:

1. Name the main functions of blood.
2. Describe the appearance and function of erythrocytes, leukocytes, and platelets. Also, discuss plasma.
3. Explain the purpose of a microhematocrit test. Describe how to collect a microhematocrit specimen and perform a microhematocrit test.
4. Describe how to obtain a specimen for and perform a hemoglobin test.
5. Cite the reasons for performing an erythrocyte sedimentation rate (ESR) test, discuss the sources of error for ESR testing, and determine and record an erythrocyte sedimentation rate obtained by using a modified Westergren method.
6. Explain the purpose of a prothrombin time (PT) test, and describe how to obtain a specimen for and perform a CLIA-waived prothrombin time/international normalized ratio (PT/INR) test. Also, explain how you could reassure a patient of the accuracy of PT/INR test results.
7. Identify the tests included in a complete blood count (CBC) and their reference ranges and differentiate between normal and abnormal test results.
8. Explain the reasons for performing a white blood cell (WBC) count and differential and discuss the preparation of blood smears for the differential.
9. Differentiate between the ABO blood groupings and the Rh blood groupings. Also, discuss legal and ethical issues related to blood transfusions.

10. Do the following related to blood chemistry in the physician office laboratory:
- Explain the reasons for testing glucose, hemoglobin A1c, cholesterol, liver enzymes, and thyroid hormones.
 - Assist a provider by performing a blood glucose test.
 - Determine a cholesterol level or lipid profile using a cholesterol analyzer.

COMPETENCIES:

Psychomotor Skills:

- | | |
|-----------|---|
| I.P.2. | Perform: |
| | c. capillary puncture |
| I.P.3. | Perform patient screening using established protocols |
| I.P.8. | Instruct and prepare a patient for a procedure treatment |
| I.P.11. | Obtain specimens and perform: |
| | a. CLIA-waived hematology test |
| | b. CLIA-waived chemistry test |
| | c. CLIA waived urinalysis |
| | d. CLIA waived immunology test |
| | e. CLIA waived microbiology test |
| III.P.2. | Select appropriate barrier/personal protective equipment (PPE) |
| III.P.10. | Demonstrate proper disposal of biohazardous material: |
| | a. sharps |
| | b. regulated wastes |
| VI.P.8. | Perform routine maintenance of administrative or clinical equipment |
| X.P.3. | Document patient care accurately in the medical record |

PROCEDURES:

- 48.1** Perform Preventive Maintenance for the Microhematocrit Centrifuge
- 48.2** Perform CLIA-Waived Hematology Testing: Perform a Microhematocrit Test
- 48.3** Perform CLIA-Waived Hematology Testing: Perform a Hemoglobin Test
- 48.4** Perform CLIA-Waived Hematology Testing: Determine the Erythrocyte Sedimentation Rate using a Modified Westergren Method
- 48.5** Perform A CLIA-Waived Protime/INR Test
- 48.6** Assist the Provider with Patient Care: Perform a Blood Glucose Test
- 48.7** Perform A CLIA-Waived Chemistry Test: Determine the Cholesterol Level or Lipid Profile Using A Cholestech Analyzer

CHAPTER 49 Microbiology and Immunology

PREPARATION:

**Read Chapter 49 in The Medical Assistant
Complete Chapter 49 in the Study Guide and Procedure Checklist Manual**

CONTENT:

This chapter examines the infection process, viruses and bacteria. The student will learn methods of prevention and spread of disease and how to provide patient education in this area.

LEARNING OBJECTIVES:

1. Describe the naming of microorganisms.
2. Describe various bacterial staining characteristics, shapes, oxygen requirements, and physical structures; also, explain the characteristics of common diseases caused by bacteria.
3. Describe the unusual characteristics of chlamydia, mycoplasma, and rickettsia organisms.
4. Do the following related to fungi, protozoa, and parasites:
 - Compare bacteria with fungi, protozoa, and parasites.
 - Identify the characteristics of common diseases caused by fungi, protozoa, and parasites.
 - Perform patient education on the collection of a stool specimen for ova and parasite testing.
5. Compare bacteria with viruses, and describe the characteristics of common viral diseases.
6. Cite the protocols for the collection, transport, and processing of specimens.
7. Explain how pinworm testing is done and when it is recommended.
8. Describe and perform CLIA-waived microbiology tests:
 - Describe three CLIA-waived microbiology tests that use a rapid identification technique.
 - Obtain a specimen, and perform the CLIA-waived rapid strep test.

9. Do the following related to CLIA-waived immunology testing:
 - Discuss the purpose of indirect immunology testing.
 - Describe three CLIA-waived immunology tests that could be done in the physician office laboratory.
 - Obtain a specimen, and perform a CLIA-waived mononucleosis test.

10. Detail the equipment needed in a microbiology reference laboratory, and discuss the identification of pathogens in the microbiology laboratory by describing various staining techniques.

11. Describe the reference laboratory assessment of a throat culture and a urine culture.

12. Explain the concepts used for culture and sensitivity testing.

13. Discuss patient education, in addition to legal and ethical issues, as it applies to laboratory testing.

COMPETENCIES:

Cognitive Knowledge:

- I.C.10. Identify CLIA waived tests associated with common diseases
- III.C.1. List major types of infectious agents
- III.C.2. Describe the infection cycle including:
 - c. susceptible host
 - d. means of transmission

Psychomotor Skills:

- I.P.8. Instruct and prepare a patient for a procedure or a treatment
- I.P.11. Obtain specimens and perform:
 - a. CLIA-waived hematology test
 - b. CLIA-waived chemistry test
 - c. CLIA waived urinalysis
 - d. CLIA-waived immunology test
 - e. CLIA-waived microbiology test
- I.P.8. Instruct and prepare a patient for a procedure treatment
- II.P.3. Maintain lab test results using flow sheets
- III.P.10. Demonstrate proper disposal of biohazardous material:
 - a. sharps
 - b. regulated wastes
- X.P.3. Document patient care accurately in the medical record

PROCEDURES:

- 49.1** Instruct Patients in the Collection of Fecal Specimens to Be Tested for Ova and Parasites
- 49.2** Collect a Specimen for a Throat Culture
- 49.3** Perform a CLIA-Waived Microbiology Test: Perform a Rapid Strep Test
- 49.4** Perform a CLIA-Waived Immunology Test: Perform the QuickVue+ Infectious Mononucleosis Test