

Montgomery County Community College  
HCP/MAS 121  
Laboratory Procedures in the Medical Office  
3-2-2

**COURSE DESCRIPTION:**

This comprehensive course introduces the student to the purpose, techniques and documentation of diagnostic laboratory procedures commonly performed in the medical office. Subjects covered include general laboratory techniques, phlebotomy, specimen collection, handling and processing, diagnostic testing and performing hematology, chemistry, urinalysis, microbiology and immunology testing. Course specific competency evaluations must be successfully completed by the student. The course will assist the student in developing basic laboratory skills and a firm understanding of the scientific method, enabling students to appreciate the scientific process, and build scientific reasoning and critical thinking skills that are applicable to their career as a health care professional. This course is subject to a course fee. Refer to <http://mc3.edu/adm-fin-aid/paying/tuition/course-fees> for current rates.

**REQUISITE(S):**Previous Courses

ESL 011 ESL Basic Writing or ENG 011 Basic Writing or ENG 010A Basic Writing and REA 011 Fundamentals of College Reading or ESL/ REA 017 Vocabulary & Reading Comprehension Development II

Previous or Concurrent Courses

HCP/MAS/BIO 104 The Human Body in Health and Disease or BIO 103 Introduction to Anatomy and Physiology or BIO 131 Human Anatomy and Physiology I and BIO 132 Human Anatomy and Physiology II  
HCP 224 Medical Terminology

| LEARNING OUTCOMES<br>Upon successful completion of this course, the student will be able to: | LEARNING ACTIVITIES   | EVALUATION METHOD         |
|--|---|---------------------------|
| 1. Demonstrate entry level performance in all identified competencies.                       | Lecture<br>Laboratory<br>Case Studies<br>Multimedia Demonstrations<br>Oral Report<br>Small Group Projects<br>Written Assignment<br>Research Resources<br>Competency Demonstration | Competency Demonstrations |

| LEARNING OUTCOMES   | LEARNING ACTIVITIES   | EVALUATION METHOD   |
|---|---|---|
| 2. Consistently apply infection control principles in the lab through the implementation of Standard Precautions.   | Lecture<br>Laboratory<br>Multimedia Demonstrations<br>Oral Report<br>Small Group Projects<br>Written Assignment<br>Research Resources<br>Competency Demonstration | Quizzes and Exams<br><br>Written Assignments<br>Clinical Simulations<br>Lab Experiments<br>Lab Activities                 |
| 3. Apply scientific reasoning and the scientific method to evaluate the implications of experiments and observations that have led to the current state of clinical reasoning.                      | Lecture<br>Laboratory<br>Multimedia Demonstrations<br>Oral Report<br>Small Group Projects<br>Written Assignment<br>Research Resources<br>Competency Demonstration | Competency Demonstrations<br>Lab Reports<br>Lab Experiments<br>Lab Quizzes<br>Lab Activities                              |
| 4. Demonstrate the ability to set up and utilize basic laboratory equipment to perform microscopy, urinalysis, blood chemistry and other CLIA-waived laboratory tests.                              | Lecture<br>Laboratory<br>Multimedia Demonstrations<br>Oral Report<br>Small Group Projects<br>Written Assignment<br>Research Resources<br>Competency Demonstration | Competency Demonstrations<br>Competency Demonstrations<br>Lab Reports<br>Lab Experiments<br>Lab Quizzes<br>Lab Activities |
| 5. Incorporate knowledge of normal and abnormal laboratory results to support deductions concerning contemporary medical, healthcare-related and/or biological issues utilizing relevant resources. | Lecture<br>Laboratory<br>Multimedia Demonstrations<br>Oral Report<br>Small Group Projects<br>Written Assignment<br>Research Resources<br>Competency Demonstration | Competency Demonstrations<br>Competency Demonstrations<br>Lab Reports<br>Lab Experiments<br>Lab Quizzes<br>Lab Activities |

| LEARNING OUTCOMES  | LEARNING ACTIVITIES   | EVALUATION METHOD   |
|--|---|---|
| 6. Develop laboratory reports that reflect the use of the scientific method for experiments performed in the laboratory. | Lecture<br>Laboratory<br>Multimedia Demonstrations<br>Oral Report<br>Small Group Projects<br>Written Assignment<br>Research Resources<br>Competency Demonstration | Competency Demonstrations<br>Competency Demonstrations<br>Lab Reports<br>Lab Experiments<br>Lab Quizzes<br>Lab Activities |

At the conclusion of each semester/session, assessment of the learning outcomes will be completed by course faculty using the listed evaluation method(s). Aggregated results will be submitted to the Associate Vice President of Academic Affairs. The benchmark for each learning outcome is that *70% of students will meet or exceed outcome criteria.*

#### SEQUENCE OF TOPICS:

- I. Scientific Method
  - a. Basic vs. Applied Science
  - b. Creating a hypothesis
    - i. Testing a hypothesis
  - c. Controlling variables
  - d. Preparing a lab notebook and documentation
- II. Introduction to Physician's Office Laboratory
  - a. Laboratory Departments
  - b. CLIA and CLIA-waived
    - i. define
    - ii. examples
  - c. Basic Lab Equipment
- III. Laboratory Safety
  - a. Handwashing
  - b. Universal vs. Standard Precautions
  - c. PPE
  - d. Cleaning up a Biohazardous spill
  - e. Physical Safety
    - i. Electrical hazards
    - ii. fire hazards
  - f. Labeling and Storage
    - i. NFPA diamond
  - g. MSDS
- IV. Microscope
  - a. label the parts
  - b. Basics
    - i. making a slide, magnification, light
- V. Quality Assurance and Quality Control

## VI. Record Keeping in Lab

- a. HIPAA
- b. Specimen (collection) Log
- c. Patient Requisitions
  - i. contents, sources
- d. Lab Manuals
  - i. examples
- e. Path of patient's test
- f. Flowsheets

## VII. Urinalysis/Urine

- a. Review of Urinary System (Anatomy and Physiology)
  - i. basic structure and function
- b. Urinalysis
  - i. definition
  - ii. what can it detect?
    - 1. kidney disease
    - 2. endocrine
    - 3. metabolic pathology
  - iii. Specimen Type
    - 1. justification for each
  - iv. Volume of urine
  - v. Basics of collection
    - 1. clean catch
  - vi. Labeling the container
- c. Urinalysis Test
  - i. procedure
  - ii. tests covered
  - iii. normal values
  - iv. what do abnormal values indicate?

## VIII. Phlebotomy/Venipuncture

- a. Equipment
- b. Types of Tubes
  - i. color
  - ii. additive
  - iii. tests
- c. Order of Draw
- d. Site Selection
- e. Basic Procedure
- f. Capillary Puncture
  - i. Basic procedure and equipment
  - ii. Site Selection

## IX. Hematology

- a. Parts of Blood
- b. CBC
  - i. definition and normal values
  - ii. RBC
  - iii. WBC (differential)
  - iv. Hemoglobin
    - 1. Procedure with Hemocue machine
  - v. Hematocrit
  - vi. ESR
- c. Blood Clotting
  - i. Platelet count
  - ii. Coagulation Studies
    - 1. PT, PTT, INR
      - a. define and normal values

## X. Blood Chemistry

- a. Common Chemistry Panels
  - i. Normals/abnormals
- b. Blood Glucose
  - i. definition
  - ii. metabolism, use and storage
  - iii. role of Insulin
  - iv. Types of Blood Glucose Tests
    - 1. Random, fasting, GTT, post-prandial, Hemoglobin A1C
    - 2. normal/abnormal results
  - v. Using a glucometer
    - 1. procedure

## XI. Immunology

- a. Immune system
  - i. antigens vs. antibodies
    - 1. specificity
    - 2. sensitivity
  - ii. Diseases caused by
- b. Common Immunoassay tests
  - i. Mono Spot
  - ii. Pregnancy test
  - iii. Group A Strep

## XII. Microbiology

- a. definition
- b. lab department
- c. Quality control
- d. transporting specimens
- e. culture media
  - i. types
  - ii. plating

- iii. reading results
- f. Fecal Blood Testing
- g. Gram-positive vs. Gram-negative
- h. Sensitivity testing

#### LEARNING MATERIALS:

Text: Cox, Phyllis and Danielle Wilken. (2011). *Palko's Laboratory Procedures* (3rd ed.). New York, NY: McGraw Hill.

Kronenberger, Judy and Woodson, Denise. (2016). *Clinical Medical Assisting* (5th ed.). Philadelphia, PA: Lippincott Williams and Wilkins.

Kronenberger, Judy and Woodson, Denise. (2016). *Clinical Medical Assisting Study Guide* (5th ed.). Philadelphia, PA: Lippincott Williams and Wilkins.

Other learning materials may be required and made available directly to the student and/or via the College's Libraries and/or course management system.

#### COURSE APPROVAL:

Prepared by: Kathleen Schreiner, RN, MSHA Date: 3/2006  
Board of Trustees Presentation Date: 6/2006

Revised by: Kathleen Schreiner Date: 1/2009  
VPAA/Provost Compliance Verification: Dr. John C. Flynn, Jr. Date: 5/11/2009

Revised by: Kathleen Schreiner Date: 7/2012  
VPAA/Provost Compliance Verification: Dr. Victoria Bastecki-Perez Date: 7/2012

Revised by: Kathleen Schreiner Date: 11/2012  
VPAA/Provost Compliance Verification: Dr. Victoria Bastecki-Perez Date: 11/2012

Revised by: Shauna LaMagna and Kathleen Schreiner Date: 10/2015  
VPAA/Provost Compliance Verification: Dr. Victoria Bastecki-Perez Date: 1/28/2016

Revised by: Shauna LaMagna and Kathleen Schreiner Date: 3/2017  
VPAA/Provost Compliance Verification: Dr. Victoria Bastecki-Perez Date: 5/16/2017

Revised by: Shauna LaMagna and Kathleen Schreiner Date: 11/2018  
VPAA/Provost or designee Compliance Verification: Date: 12/19/2018



*This course is consistent with Montgomery County Community College's mission. It was developed, approved and will be delivered in full compliance with the policies and procedures established by the College.*