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

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<th>LEARNING OUTCOMES</th>
<th>LEARNING ACTIVITIES</th>
<th>EVALUATION METHOD</th>
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<td>Upon successful completion of this course, the student will be able to:</td>
<td>Lecture</td>
<td>Competency Demonstrations</td>
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<td>1. Demonstrate entry level performance in all identified competencies.</td>
<td>Laboratory</td>
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<td>Case Studies</td>
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<td>Multimedia Demonstrations</td>
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| 2. Consistently apply infection control principles in the lab through the implementation of Standard Precautions. | Lecture  
Laboratory  
Multimedia Demonstrations  
Oral Report  
Small Group Projects  
Written Assignment  
Research Resources  
Competency Demonstration | Quizzes and Exams  
Written Assignments  
Clinical Simulations  
Lab Experiments  
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  
Laboratory  
Multimedia Demonstrations  
Oral Report  
Small Group Projects  
Written Assignment  
Research Resources  
Competency Demonstration | Competency Demonstrations  
Lab Reports  
Lab Experiments  
Lab Quizzes  
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  
Laboratory  
Multimedia Demonstrations  
Oral Report  
Small Group Projects  
Written Assignment  
Research Resources  
Competency Demonstration | Competency Demonstrations  
Competency Demonstrations  
Lab Reports  
Lab Experiments  
Lab Quizzes  
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  
Laboratory  
Multimedia Demonstrations  
Oral Report  
Small Group Projects  
Written Assignment  
Research Resources  
Competency Demonstration | Competency Demonstrations  
Competency Demonstrations  
Lab Reports  
Lab Experiments  
Lab Quizzes  
Lab Activities |
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<td>6. Develop laboratory reports that reflect the use of the scientific method for</td>
<td>Lecture</td>
<td>Competency Demonstrations</td>
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<td>experiments performed in the laboratory.</td>
<td>Laboratory</td>
<td>Competency Demonstrations</td>
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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:


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.