



MERCER
COUNTY COMMUNITY COLLEGE

COURSE OUTLINE

| Course Number | Course Title | Credits |
|---------------------------|---|----------------------------|
| MLT 215 | Clinical Practice | 10 |
| Hours: | Co- or Pre-requisite | Semester & Year |
| Lecture/Lab/Other | MLT 112, MLT 200, MLT 207, MLT 212, MLT214, or permission of program coordinator | Spring 2024 |
| 560 Clinical hours | | |

Catalog description:

Clinical practice at an affiliated facility under the direction and supervision of laboratory educators. Students conduct routine analytical procedures, develop laboratory skills, apply knowledge of testing principles, and demonstrate acquired laboratory competencies that were gained during the professional phase courses of the program. Performance objectives and task checklists are used in each department to assess acquired laboratory competencies. Includes presentation of a laboratory case study correlating test results with clinical condition.

General Education Category:
Not GenEd

Course coordinator:

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Required texts & Other materials:

No required textbook for this course

Below are suggested review materials to prepare for MLT certification exams

i. For a list of laboratory tests and meanings:

- a) Mosby's Diagnostic & Laboratory Test Reference 13th ed Authors: Kathleen Deska Pagana PhD RN, Timothy J. Pagana MD FACS, Theresa N Pagana MD ISBN-13: 978-0323399579

ii. For students who enjoy practice tests:

- a) American Society of Clinical Pathology (ASCP) BOC Study Guide 5th edition Authors: Patricia Tanabe, E. Blair Holladay ISBN-13 978-0891895879
- b) Medical Laboratory Science Review 4th Edition Authors: Robert R. Harr MS MLS (ASCP) ISBN-13: 978-0803628281

iii. Practice test websites:

- a) MediaLab Subscription (usually provided by program budget) <https://www.medialab.com/> . To register on your own http://www.labce.com/register_game.aspx
- b) ASCP practice tests/bundles: <https://lp.ascp.org/boceamprep/>

iv. For students who want a concise review of material:

- a) SUCCESS! in Clinical Laboratory Science 4th Edition ISBN-13: 978-0135126486
- b) Quick Review Cards for Medical Laboratory Science Valerie Dietz Polansky ISBN-13: 978-0803629561
- c) Patsy Jarreau. Clinical Laboratory Science Review: A Bottom Line Approach. 4th Edition. ISBN-13: 978-0967043425

Course Student Learning Outcomes (SLO):

The clinical practicum is designed to prepare students for MLT career entry-level employment.

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

1. Demonstrate competency in collecting, processing and analyzing biological specimens in the clinical laboratory. (Supports ILG# 1, 3, 4, 10, 11; PLO#2, 3, 6)
2. Apply the basic concepts and principles learned in the didactic portion of the curriculum to current methodologies used in today's clinical laboratories. (Supports ILG# 1, 3, 4, 9, 10, 11; PLO#2, 3, 4, 6)

3. Properly use supplies, equipment and instrumentation for laboratory procedures. (Supports ILG# 4; PLO#1, 2, 6)
4. Use standard precautions when handling, processing and analyzing body fluid samples. (Supports ILG# 3, 9; PLO# 2, 6)
5. Collect, process, and analyze biological samples following standard operating procedures; recognize pre-analytic, analytic and post-analytic factors that can affect laboratory test results. (Supports ILG# 3, 9, 11; PLO# 1-4)
6. Operate computerized instruments and associated laboratory software effectively. (Supports ILG# 4; PLO#1, 2, 6)
7. Safely and accurately calibrate and quality control lab instruments and equipment recognizing the need for corrective action, maintenance, and documentation. (Supports ILG# 1, 4, 11; PLO#1, 2, 6)
8. Identify normal, abnormal, and critical laboratory results for each laboratory department. Correlate laboratory results to clinical diagnosis. Recognize age and gender reference value differences for diverse patient populations. (Supports ILG# 1, 3; PLO#1, 2, 3, 4, 6)
9. Demonstrate professional conduct consistent with ethical guidelines for health care professional. (Supports ILG#9; PLO# 4,5)
10. Communicate effectively using verbal, written, oral and electronic modalities for a diverse population of patients and health care professionals. (Supports ILG# 1, 4, 10; PLO#1, 2, 4, 6)

Course-specific Institutional Learning Goals (ILG):

Institutional Learning Goal 1. Written and Oral Communication in English. Students will communicate effectively in both speech and writing.

Institutional Learning Goal 3. Science. Students will use the scientific method of inquiry, through the acquisition of scientific knowledge.

Institutional Learning Goal 4. Technology. Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals.

Institutional Learning Goal 9. Ethical Reasoning and Action. Students will understand ethical frameworks, issues, and situations.

Institutional Learning Goal 10. Information Literacy: Students will recognize when information is needed and have the knowledge and skills to locate, evaluate, and effectively use information for college level work.

Institutional Learning Goal 11. Critical Thinking: Students will use critical thinking skills understand, analyze, or apply information or solve problems.

Program Learning Outcomes (PLO) for Medical Laboratory Technology

1. Integrate knowledge learned and experienced in the disciplines of general education, mathematics, science, and medical laboratory science;
2. Achieve entry-level career competencies of a medical laboratory technician by testing biological samples using current technology to generate accurate, quality-assured laboratory results used for health and disease evaluation;
3. Utilize critical-thinking skills to assess and problem- solve laboratory data for patient diagnoses;
4. Maintain familiarity with the profession's code of ethics and consistently act within those standards during interactions with fellow classmates and working professionals in the clinical setting;
5. Describe the importance of continuing education in lifelong learning and in obtaining and upholding professional credentialing;
6. Demonstrate academic and technical competence in the professional courses of the curriculum through college and applied clinical education experiences;
7. Take the national ASCP certification exam.

Weeks of study in detail – Unit Student Learning Outcomes:

Week 1 PHEBOTOMY PERFORMANCE OBJECTIVES [Supports Course SLOs #1-5, 10]

At the end of the rotation the student will be able to:

Learning & Technical Objectives

1. Demonstrate safety practices that apply to phlebotomy procedures.
2. Perform phlebotomy procedures using standard operating procedures for venipuncture technique.
3. Maintain patient confidentiality and follow HIPAA guidelines established at the medical facility.
4. Communicate with patients, explaining procedures.

Week 2 URINALYSIS PERFORMANCE OBJECTIVE [Supports Course SLOs # 2, 4, 6, 7, 9, 10]

At the end of the rotation the student will be able to:

Learning & Technical Objectives

1. Determine specimen integrity and acceptability for samples process in the urinalysis laboratory.
2. Prepare specimens for analysis.
3. Perform and record routine instrument and test kit set up, quality control and maintenance.
4. Perform macroscopic, physical, and chemical examinations of urine.
5. Perform microscopic examinations of urine.
6. Perform confirmatory tests on urine.
7. Interpret and report results of a urinalysis correlating data to human renal and metabolic physiology.
8. Complete a competency practical in urinalysis.

Weeks 3-5 CLINICAL CHEMISTRY PERFORMANCE OBJECTIVES [Supports Course SLOs # 2, 4, 6, 9, 10]

At the end of the rotation the student will be able to:

Learning & Technical Objectives

1. Perform quality control procedures, monitor Q.C. results, and understand corrective action if Q.C. is not within standardized limits.
2. Organize workload and perform specimen evaluation.
3. Prepare samples for processing.
4. Perform instrument programming and calibration. Understand basic maintenance and troubleshooting of instruments.
5. Perform routine assays with instruction and supervision.
6. Perform or observe special chemistry procedures performed in the affiliate site.
7. Understand criteria to accept/reject results, perform delta checks, and perform dilutions and calculations required for test procedures.
8. Demonstrates knowledge of normal, abnormal and critical values. Correlate test results with common disease states and identify common chemistry profiles.
9. Calculate problems of reagent preparation, dilutions, and creatinine clearance tests.
10. Complete a competency practical in clinical chemistry.

Weeks 6-8 CLINICAL HEMATOLOGY AND COAGULATION PERFORMANCE OBJECTIVES [Supports Course SLOs # 2, 4, 6, 7, 9, 10]

At the end of the rotation the student will be able to:

Learning & Technical Objectives

1. Organize, process, handle patient specimens using standard operating procedures for specimen integrity, collection, and storage.
2. Describe instrument principles, start-up, operation, workload processing, and basic instrument troubleshooting.
3. Interpret and correlate histograms.
4. Prepare, stain, and evaluate blood smears, read normal and abnormal differentials.
5. Analyze and evaluate body fluid specimens for cell counts and differential smears.
6. Perform and evaluate special hematology procedures, reticular counts, ESR, sickle cell preps, WBC and platelet estimations.
7. Perform and evaluate coagulation tests, ex. PT and PTT, fibrinogen, and mixing studies.
8. Know reference range values and critical values for tests performed in the hematology/coagulation department.
9. Explain the factors involved in the quality assurance program in the hematology/coagulation department.
10. Complete a competency practical in Hematology and Coagulation.

Weeks 9-12 CLINICAL IMMUNOHEMATOLOGY PERFORMANCE OBJECTIVES [Supports Course SLOs # 2, 4, 6, 7, 9, 10]

At the end of the immunohematology rotation the student will be able to:

Learning & Technical Objectives

1. Demonstrate knowledge of the policies which determine accurate blood bank sample integrity and sample identification
2. Perform ABO forward and reverse blood grouping; perform Rh typing. Perform antibody screen and antibody identification by using panel cells, rule out technique, selected cells and antigen typing.
3. Select donor units and perform compatibility testing.

4. Perform DAT testing and an elution study.
5. Understand the storage selection and criteria for transfusion of component therapies: packed RBC, fresh frozen plasma, platelets, and cryoprecipitate.
6. Perform quality control procedures and be knowledgeable of AABB regulations for a transfusion service or blood bank.
7. Perform cord blood testing and apply this knowledge to evaluate Hemolytic Disease of the Fetus/Newborn.
8. Complete a competency practical in Blood Bank.

Weeks 13-16: CLINICAL MICROBIOLOGY PERFORMANCE OBJECTIVES [Supports Course SLOs # 2, 4, 6, 7, 9, 10]

At the end of microbiology rotation the student will be able to:

Learning & Technical Objectives

1. Evaluate sample integrity and sample acceptability for specimens received in the microbiology laboratory demonstrating knowledge of criteria used for specimen evaluation to accept/reject cultures.
2. Organize specimen processing and computer/worksheet data entry and result recording.
3. Perform timely processing of clinical specimen, inoculate appropriate primary media and choose appropriate conditions for incubation.
4. Perform and interpret gram stains from culture and direct smears.
5. Observe and interpret primary cultures.
6. Compare selective and differential media and understand the principle and operation of the biochemical identification systems and instruments used to identify the organisms.
7. Differentiate normal flora from pathogens from different culture sites.
8. Perform the set up for antimicrobial susceptibility testing.
9. Demonstrate knowledge of non cultural techniques performed in the microbiology laboratory which may include immunologic, fluorescent and molecular biology techniques.
10. Perform quality control procedures applicable to all lab procedures in microbiology.
11. Demonstrate knowledge of critical values in the microbiology laboratory.
12. Complete a competency practical in Microbiology.

Weeks 16: CASE STUDY OBJECTIVES [Supports Course SLOs# 2, 8, 10]

At the end of the rotation the student will be able to:

1. Develop and present a patient case study. Students will be graded on organization of the presentation along with other listed guidelines.
2. Answer questions asked by peers and laboratory personnel in attendance for the case study

Evaluation of student learning:

1. Lecture

- a) Students will have weekly homework assignments through Blackboard LMS or via MediaLab Inc and must be completed to assess understanding of the theoretical concepts discussed in the lecture PowerPoints.
- b) Students will complete a weekly quiz, bi-weekly exams and final assessment through Blackboard LMS or via MediaLab Inc.
- c) Give a presentation on a common infectious agent including clinical symptoms, laboratory diagnostics and treatment of the microbe.

2. Lab

- a) Students will complete weekly quizzes (pre-lab and/or post-lab) and complete weekly homework assignments that pertain to the laboratory exercises.
- b) There will be written and hands-on practical assessments every couple of weeks throughout the course to assess competency level.
- c) Students will work through case studies for patients with different etiologies and teach their fellow classmates.
- d) Laboratory Session Professional Performance- Students' professional performances will be evaluated during each of the laboratory sessions and weekly feedback will be given on how to improve. The grading scale for each of the categories below is that a student can score between 0-2 points (0= Unsatisfactory, 1=Satisfactory, 2=Exceeds Expectations).
 - i) PROFESSIONAL PERFROMANCE EVALUATION:

1. **DEPENDABILITY**
 - The student arrives in the laboratory with adequate time to start lab session as scheduled. The student comes with appropriate manual and supplies, and wearing required laboratory attire. The student shows evidence of having reviewed the assigned topic before coming to the laboratory. The student completes assignments (lab reports, homework assignments, etc) on time.
2. **ATTENTIVENESS**
 - The student is attentive to the instructor, takes complete notes and proceeds with laboratory work without repeated instructions. The student follows verbal and written instructions, asks pertinent questions when necessary, and seeks the instructor's assistance when needed. The student neither distracts others nor allows distractions to affect completion of laboratory exercises.
3. **ORGANIZATION**
 - The student demonstrates the ability to organize work to be done within the available laboratory time. The student is able to perform multiple tasks without jeopardizing accuracy and precision.
4. **INDEPENDENCE**
 - The student demonstrates the ability to work independently by exercising independent judgement and thinking logically in using the protocols and instructions given. The student draws on previously gained information to solve problems without prompting from instructor. The student seeks activities to expand knowledge, ability and performance.
5. **RECORD KEEPING**
 - The student demonstrates the importance of proper record keeping by accurately and legibly labeling/recording laboratory work and reports (i.e. sample containers, reagents and worksheets).
6. **MANAGEMENT AND ECONOMY**
 - The student conserves reagents and supplies. The student maintains an adequate supply of common use items at their appropriate workstation. The student takes proper care of equipment
7. **SAFETY**
 - The student works in an orderly and safe manner, enabling others to safely work in the same general area. The student adheres to the guidelines of the Laboratory Safety Regulations (e.g. wearing eye protection, keeping long hair tied back, and properly storing hazardous materials).
8. **INTERPERSONAL SKILLS**
 - The student communicates in a professional, positive, tactful manner with peers and instructors. The student consistently shows common courtesy (e.e. restocks supplies) and contributes towards achieving an environment conducive to work and learning for self and others.
9. **Composure**
 - The student maintains composure and work quality under stressful conditions and adapts quickly to new situations. The student recognizes his/her own personal strengths and weaknesses and works positively within that framework. The student accepts evaluation of performance as constructive when offered by instructors and follows through with suggestions made.
10. **INTEGRITY**
 - The student accepts accountability for work performed. The student readily admits errors, follows procedures (including quality control) as written, and maintains confidentiality of patient results, if applicable. Student exhibits perseverance to obtain accurate results

Course Grading

| | | | |
|----|---------|-----------|--|
| A | 93-100% | B- | 80-82 |
| A- | 90-92 | C+ | 77-79 <- minimum grade needed for total course grade |
| B+ | 87-89 | C | 70-76 <- minimum grade needed in Laboratory |
| B | 83-86 | D | 60-69 |
| F | 0-59% | | |

Lecture (50% of total grade)

| | | |
|--------------|---|--------------------|
| Presentation | 5% | |
| Assignments | 10% | |
| Quizzes | 10% | |
| Exams | 10% | |
| Final | <u>15%</u> | |
| | <u> </u> % x .50 = <u> </u> | Lecture Percentage |

Laboratory (45% of total grade)

SOPs/ Assignments 10%
Lab Practicals 10%
Quizzes/Pre-Labs 10%
Final (questins/unknown) 15%

_____ % x .40 = _____ Lab Percentage

Professionalism (Affective) 5% of totale grade

Attendance _____/1000 points possible (100% for presence, 50% if tardy, & 0% if absent for each week)

Professionalism* _____/100 points

_____ /880 = x .05 = _____ Affective Percentage

_____ Final Total Grade= Lecture Percentage + Lab Percentage + Professionalism