MLT 215
CLINICAL PRACTICE
COURSE OUTLINE

Hours: Pre requisites: MLT 112, 200, 207, 212 & 214
Clinical lab practice Credits: 10
14 weeks/560 hours

Catalog description:
Clinical practice takes place in an approved facility under the direction and supervision of laboratory educators. Students will perform routine analytical procedures, continue to develop their laboratory skills and apply knowledge gained during the professional phase of the program. Performance objectives and task checklists are used in each department to assess acquired laboratory competencies.

Suggested texts and study materials:
- For a list of laboratory tests and meanings:
  *Mosby’s Diagnostic & Laboratory Test Reference* 13th ed.
  Authors: Kathleen Deska Pagana PhD RN, Timothy J. Pagana MD FACS, Theresa N Pagana MD

- For students who enjoy practice tests:
  *American Society of Clinical Pathology (ASCP) BOC Study Guide* 5th edition
  Authors: Patricia Tanabe, E. Blair Holladay

  *Medical Laboratory Science Review* 4th Edition
  Authors: Robert R. Harr MS MLS (ASCP)


- For students who want a concise review of material:
  *SUCCESS! in Clinical Laboratory Science*
  4th Edition

  Quick Review Cards for Medical Laboratory Science
  Valerie Dietz Polansky

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MCCC General Education Goals and Core Skills

General Education Knowledge Goals

Goal 1. Communication. Students will communicate effectively in both speech and writing.

Goal 2. Mathematics. Students will use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.

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

Goal 8. Diversity. Students will understand the importance of a global perspective and culturally diverse peoples.


Core Skills

Goal A. Written and Oral Communication in English. Students will communicate effectively in speech and writing, and demonstrate proficiency in reading.

Goal B. Critical Thinking and Problem-solving. Students will use critical thinking and problem solving skills in analyzing information.

Goal C. Ethical Decision-Making. Students will recognize and assess ethical issues and situations.

Goal D. 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.

Goal E. Computer Literacy. Students will use computers to access, analyze or present information, solve problems, and communicate with others.

Goal F. Collaboration and Cooperation. Students will develop the interpersonal skills required for effective performance in group situations.

Course Specific Competencies/Goals

The clinical practicum is designed to prepare students for MLT career entry-level employment. Upon completion of the clinical rotations students will be able to:

1. Demonstrate competency in processing and analyzing biological specimens in the clinical laboratory.
2. Apply the basic concepts and principles learned in the didactic portion of the curriculum to current methodologies used in today’s clinical laboratories.
3. Properly use supplies, equipment and instrumentation for laboratory procedures.
4. Use standard precautions when handling, processing and analyzing body fluid samples.
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.
6. Operate computerized instruments and associated laboratory software effectively.
7. Safety and accurately calibrate and quality control lab instruments and equipment recognizing the need for corrective action, maintenance, and documentation.
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.
9. Demonstrate professional conduct consistent with ethical guidelines for health care professional.
10. Communicate effectively using verbal, written, oral and electronic modalities for a diverse population of patients and health care professionals.
Unit 1  URINALYSIS PERFORMANCE OBJECTIVE
At the end of the urinalysis 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.

Unit 2  HEMATOLOGY AND COAGULATION PERFORMANCE OBJECTIVES
At the end of the hematology and coagulation 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.

UNIT 3  IMMUNOHEMATOLOGY PERFORMANCE OBJECTIVES
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.

UNIT 4 MICROBIOLOGY PERFORMANCE OBJECTIVES
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.

UNIT 5 CHEMISTRY PERFORMANCE OBJECTIVES
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.

UNIT 6 PHELOBOTOMY PERFORMANCE OBJECTIVES
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.

UNIT 7 CASE STUDY
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. Weekly Journal Entries (Blackboard) (140 points; 10 Points for each journal entry)
   Each student is required to maintain a journal for the duration of the clinical practicum. Journals are one of the most frequently prescribed methods of reflecting on lifetime experiences. You may record the sequence of daily events, as well as unusual or memorable situations or events that transpired and how you reacted to them. What happened? How did you react? How would you react the next time you encounter a similar situation? Or perhaps provide a commentary about a particular laboratory employee or environment that you encounter. Think about how your day impacted you professionally. Write regularly and record the date and time of each entry. **A minimum of one entry per week is required. You must submit the journal by Sunday at 1159pm (ET).** Ex. First entry will be due by Sunday March 26th 1159pm) You must address the following questions at least once during your rotation within the 14 weeks rotation.
   - Explain your feelings on the importance of the medical laboratory science profession?
   - As laboratory technicians, we have a duty to possess good work ethic. This includes ensuring that the laboratory results we produce are accurate and reliable and that we are accountable for our results. Have you met an employee that exhibits this trait?
   - What have you learned clinically and how have your experiences affected your professional development?
   - Do you feel that this clinical experience is preparing you for the real world? What are your goals (it can be professional, educational, etc) Will this experience help you achieve your future goals?

2. Upholding the Attendance Policy (96 Points for each day)
   Attendance records will be maintained at the clinical facility with a sign in/sign out for the entire length of the clinical rotation (14 weeks). Full attendance is required to successfully complete each rotation. Any day of absence must be called to the assigned department prior to the time you are due to report to the lab (ex. 7am). Note the time and person with whom you left the message. Any absence must be made up in agreement with the department instructors. Make up days may extend the course beyond 14-weeks. The extension is allowed within the time frame of the contractual agreement with the clinical facility. Some facilities may not allow you to makeup missed days. This will negatively affect your grade.
   - Student **MUST** turn in the Attendance Record **within one work week** of the completed rotation.

   **Lateness Policy**
   Absence and lateness will be recorded. If a student is late or absent more than 2 times, it will be documented as an occurrence requiring corrective action. A pattern of lateness or absence involving more than 3 occurrences may result in the student being dismissed from the course.
3. **Student Checklists/Forms (30 Points; 10 Points Each Checklist)**
   a. **Orientation checklist** - first day of orientation checklist
   b. **Departmental checklists** will help students to focus on the objectives of the course. The checklists will be assessed weekly by laboratory instructors noting if skills have been achieved or need improvement. Need for improvement will require an action plan to be developed in order to help the student improve the required skill. These checklists **will be used by the clinical educators to complete the final evaluation** of the student. **These will be collected** by the Clinical Coordinator.
   c. **Affiliate Site Evaluations** - students must complete an evaluation of their rotation

4. **Evaluations of Student by Clinical Site/ Final Clinical Assessment (900 points)**
   The student will be graded at the completion of each department rotation based on his or her professional attributes (Affective domain), understanding of assay procedures and principles (Cognitive domain) along with department-specific technical skills (Psychomotor domain).

   A final assessment will be given at the end of each of the rotations including phlebotomy and urinalysis. These exams will be graded and used by the educators to complete the form as well.

   The final assessment exams must be performed to the following competency levels:
   - **Immunohematology**
     All ABO and Rh testing and Choice of donor units must be performed to the 100% competency level.
     The practical exam for immunohematology must be performed to the 77% competency level.
   - **Hematology**
     The practical exam for hematology must be performed to the 77% competency level.
   - **Microbiology**
     The practical exam for microbiology must be performed to the 77% competency level.
   - **Clinical Chemistry**
     The practical exam for clinical chemistry must be performed to the 77% competency level.
   - **Urinalysis**
     Urinalysis practical exams must be performed to the 77% competency level
   - **Phlebotomy**
     Phlebotomy practical exams must be performed to the 77% competency level.

   The site clinical liaison will complete the “Evaluation of Student Form” after receiving input from educators in each of the departments relating to the different domains and reviewing the final assessment.

5. **Case Study (100 points)**
   Develop and present a patient case study. Students will be graded on organization of the presentation along with other listed guidelines. Answer questions asked by peers and laboratory personnel in attendance for the case study.

6. **Comprehensive Examination (100 points)**
   Each student is required to pass a comprehensive examination to be certified as having successfully completed an approved course of study in Medical Laboratory Science, thus becoming eligible for a national certifying examination. Failure in this examination will not preclude the student graduating from the University. However, it may prevent the student from being authorized by the Program Director of
the Department to be eligible for national certifying examinations.

**Structure:** The Comprehensive (Comp) Exam is a criterion reference exam. Each Medical Laboratory Science course has contributed a number of questions from their discipline as follows:

- Phlebotomy
- Immunology/Serology
- Urinalysis/Body Fluids
- Microbiology
- Chemistry
- Immunohematology
- Hematology
- Information Technology/Laboratory Operations (TQM, QA, QC)

If a student fails to successfully pass a section with a 77% or greater, the student will have to take a RETAKE EXAM. The two scores will be averaged and the AVERAGE must be a 77% or higher.

**Grading:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
<th>Maximum Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly Journal Entries</td>
<td>8%</td>
<td>140</td>
</tr>
<tr>
<td>Attendance sheet</td>
<td>8%</td>
<td>96</td>
</tr>
<tr>
<td>Student Checklists</td>
<td>10%</td>
<td>30</td>
</tr>
<tr>
<td>Evaluation by Clinical Sites</td>
<td>54%</td>
<td>900</td>
</tr>
<tr>
<td>Hematology</td>
<td>9%</td>
<td>150</td>
</tr>
<tr>
<td>Chemistry</td>
<td>9%</td>
<td>150</td>
</tr>
<tr>
<td>Microbiology</td>
<td>9%</td>
<td>150</td>
</tr>
<tr>
<td>Immunohematology</td>
<td>9%</td>
<td>150</td>
</tr>
<tr>
<td>Phlebotomy</td>
<td>9%</td>
<td>150</td>
</tr>
<tr>
<td>Urinalysis</td>
<td>9%</td>
<td>150</td>
</tr>
<tr>
<td>Case Study</td>
<td>10%</td>
<td>100</td>
</tr>
<tr>
<td>Comprehensive Exam</td>
<td>10%</td>
<td>100</td>
</tr>
</tbody>
</table>

**Grading scale:**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Points Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93-100 (1270-1366 pts)</td>
</tr>
<tr>
<td>A-</td>
<td>90-92 (1229-1257 pts)</td>
</tr>
<tr>
<td>B+</td>
<td>87-89 (1188-1216 pts)</td>
</tr>
<tr>
<td>B</td>
<td>83-86 (1134-1175 pts)</td>
</tr>
<tr>
<td>B-</td>
<td>80-82 (1093-1120)</td>
</tr>
<tr>
<td>C+</td>
<td>77-79 (1052-1079 pts)</td>
</tr>
<tr>
<td>C</td>
<td>70-76 (956-1038 pts)</td>
</tr>
<tr>
<td>D</td>
<td>60-69 (820-943 pts)</td>
</tr>
<tr>
<td>F</td>
<td>below 60 (&lt;820 pts)</td>
</tr>
</tbody>
</table>

**GRADING received for CLINICAL ROTATION PORTION:**

The Evaluation by the Clinical Sites for Competency makes up 54% of the total grade. This 54% is determined by having each department that the student has rotated through complete an evaluation sheet. This evaluation sheet will be completed after the student has completed at least 80% of their checklist, passed a final assessment and has completed his or her time in that department. Each department evaluation sheet will add to the 900
Total Points that is possible. The department evaluation sheet is calculated by using the 30 performance competency objectives and multiplying by the respective values assigned (Ex. All 30 objectives received a rating of 5. 30x5=150 points)

**Academic Integrity Statement:**

Any student who (1) knowingly represents the work of others as his/her own, (2) uses or obtains unauthorized assistance in the execution of any academic work, and (3) gives fraudulent assistance to another, is guilty of cheating. Violations will be reported to the MCCC Academic Integrity Committee. MLT students must conform to the policies and regulations of the clinical affiliate and the policies and regulations as described in the MLT Program Handbook. Professional behaviors and conduct are expected.

**Grievances**

During clinical practicums, any student grievance shall be discussed with the department Clinical Instructor first, and the Laboratory Clinical Educator Liaison, if necessary. If a problem is unresolved, the MCCC Clinical Coordinator, Clinical Liaison, Section Supervisor, and Clinical Instructor will meet to have a consultation relating to the matter of concern.

Students should be aware that MCCC maintains a clinical affiliation agreement with the hospital site. Clinical affiliates maintain the right to remove a student from the clinical practicum if the student’s behavior is in any way disruptive or detrimental to the hospital/laboratory, employees or patients or violates any section of the affiliation agreement.

**Support Services for Differing Abilities**

Mercer County Community College is committed to ensuring the full participation of all students in its programs. If you have a documented differing ability, or think that you many have differing ability that is protected under the ADA and section 504 of the Rehabilitation Act, please contact Arlene Stinson in LB 216 stinsona@mccc.edu for information regarding support services. If you do not have a documented differing ability, other support services are available to all students on campus including the Learning Center located in LB 214.