COURSE OUTLINE

Course Title: INTRODUCTION TO MEDICAL LABORATORY TECHNOLOGY
Course Number: MLT 112
Credits: 3

On-campus or Hybrid format

Hours:
Lecture 2/ Lab 3

Pre-requisite:
Bio 102 or 104
Or permission of instructor

Catalog description: Basic principles, techniques and vocabulary applicable to medical laboratory technology. Overviews professional societies and major regulatory agencies; reviews safety lab practices that follow OSHA Standards, emphasizing specimen collection and preservation; urinalysis and clinical microscopy; phlebotomy; introduction to serology; and lab information systems. The lab component develops laboratory skills related to lecture topics.

Revision Date: 1/2020

Course Coordinator: Lisa M Shave M.S., MLS(ASCP)CM\SBB\CM
Course Instructor: Office hours: In-person
ZOOM virtual meeting: Any day/time by appt. only

Phone: Email:

Course Materials
Required
2. White lab coat- This must be a knee-length coat with a fitted wristband/cuff; it reduces the potential for splashes up the arm and fire hazards.
3. Gloves - latex or nitrile, not vinyl
4. Pocket calculator
5. Digital timer that indicates time in minutes and seconds.
6. Black or blue ink pen. (NO WORK IN PENCIL ACCEPTED)
7. Sharpie or other permanent marker, fine point, black or blue
8. Notebook/3 ring binder:
   √ Tabs or dividers are needed to identify and separate the following sections: Syllabus - including schedule and unit objectives, lecture PowerPoints, graded materials & other informative material.
9. Laboratory manual:
   √ Purchase from bookstore or print laboratory exercises BEFORE class. Save all procedures, pre-labs, in-lab exercises, case studies and study questions.

Recommended
10. LabTestsOnline.org (website)
11. Immunology textbook

12. Urinalysis textbooks

13. Phlebotomy textbook

Course Format/Delivery

On-campus: This is a face-to-face course whereby students meet two days a week. Didactic course material is presented on-campus with lecture-based instruction in the morning followed by student laboratory sessions in the afternoon. The course requires a lot of outside proactive work by the student. The instructor will provide guidance as needed. Students will access and print out course materials from the course’s Blackboard shell. Assessment activities are provided as a means of assisting students in determining their level of competence in given areas as well as to assist in reviewing for examinations. Weekly homework assignments will be required to enhance the student's learning experience.

Hybrid: This is a web-blended course whereby didactic course material is presented mainly online and student laboratory sessions are held weekly on the college campus. The course requires a lot of outside proactive work by the student. The instructor will provide guidance as needed. Students will access and print out course materials from the course’s Blackboard shell. Lab manuals are available for purchase at the MCCC bookstore. Assessment activities are provided as a means of assisting students in determining their level of competence in given areas as well as to assist in reviewing for examinations. Assignments will be posted to enhance the student’s learning experience. Online discussion boards are mandatory; they are an essential tool for communication between peers and between students and instructors. The student must take all major examinations (midterm and final) at an approved testing center.

Technology Expectations

Students must have access to a computer with Internet connection, either at home, the library or MCCC campus. A 56K modem connection is recommended. Mozilla Firefox 3.6 browser is recommended, although Internet Explorer 7 and 8, Google Chrome and Safari 4.3.2 can be used. AOL is NOT supported by Blackboard. Cookies, JavaScript, Active Scripting and Pop-up Windows must be enabled on the browser you use.

Schedule

Lecture Meeting Days: Tuesdays and Thursdays (OC) and Blackboard LMS (Hybrid)

Lecture Modes of Instruction
   - PowerPoints that can be accessed via Blackboard prior to the course.
   - MediaLab, Inc (click for link)
   - Other (YouTube Videos, etc.)
   - KAHOOT!

The instructors may use short 5-10 question quizzes at the beginning of class to evaluate student understanding of the homework assignments and some class meeting content. To make these assessments more enjoyable for the students, we will use the Kahoot game-based web/mobile application to administer the quizzes. To earn participation credit, students must log on to Kahootit.com from any tablet, smartphone or laptop and enter a NICKNAME. For more information, visit kahoot.it.com

Laboratory Room/Time: MS320 on Tuesdays and Thursdays (OC) and Wednesdays (Hybrid). Face-to-face laboratory sessions will take place in the afternoon on meeting days in Room MS320, during the semester and will be mandatory. All laboratory procedures MUST be PRINTED for each laboratory session. Students must abide by all policies contained in the college and program handbook & Lab Safety Manual.

Time Commitment

According to Flint’s “Surviving College,” (https://www.umflint.edu/advising/surviving_college.htm) you should budget your time per week for this three hour credit course as follows:

1. PowerPoints/Readings assigned: 2 to 3 hours
2. Assignments: 3 to 6 hours
3. Time for review and test preparation: 3 hours
4. Total study time per week 7 to 10 hours PER WEEK
**Blackboard On-Line System**

This course will be conducted using the computer on-line Blackboard learning system. **Online tutorial sessions** are available to help you understand how to use Blackboard. The dates/times can be found on the MCCC website by [clicking here](#). Students may use their home computers OR may access all materials using any public computer or electronic device. **Students are strongly advised NOT to use iPads, tablets or cell phones to take course quizzes/examinations.**

**Logging in to Blackboard**

- To get to Blackboard, use this URL: [Click here](#) or you can log in through your MyMercer Portal. Enter your username, and then enter your password (the password you set up when activating your account). Click Login. Click the name of your course in the My Courses area to enter the course site. If you do not see your course listed, it may be because your instructor has not yet made the site available. If you are sure that you registered for the course, check back later. Contact your instructor via email if the course is not available when the semester begins. You will see course materials as individual documents or in folders in content areas such as Course information, Course Documents, or Assignments or whatever name the instructor uses. If a document is not immediately displayed on the screen, click on the link to the file to either view it in the browser or save it on your own computer to open with the appropriate program.

**Use of MCCC Email**

All students will be required to use the email address issued by MCCC to access course materials, learning activities, and quizzes on-line. (Students may forward their MCCC email to their personal email accounts, if desired. Directions on forwarding Gmail accounts can be found by clicking [this link](#). In addition, all College e-mail communication (events, closings, delayed openings, etc.) to students will be sent solely to the student’s MCCC email account, with the expectation that such communications will be read in a timely fashion.

**College Policies:**

The current college student handbook can be found by clicking [here](#) and contains important documents for understanding your rights and responsibilities as a student in the MCCC classroom (face-to-face or online). Please read your catalog and handbook as they supplement this syllabus, particularly for information regarding:

- Student Conduct Code
- Academic Integrity Code
- Student Grade Appeal Process

**Course Goals & Competencies**

The student will be able to:

1. Identify the role of a medical laboratory professional in providing laboratory data that is used in the assessment of health and diseases.
2. Develop an awareness of medical ethics and its application to the practice of health care.
3. Demonstrate knowledge of the major laboratory disciplines and basic laboratory techniques including specimen collection and preservation, laboratory safety, microscopy and the function of laboratory information systems.
4. Explain the value of using quality assurance programs in providing accurate and precise laboratory data.
5. Apply knowledge of phlebotomy and renal physiology to the collection and evaluation of body fluid samples.
6. Demonstrate competent laboratory skills in the preparation and analysis of clinical laboratory samples.
7. Demonstrate knowledge of the Immune System and how it applies to specimen analysis is Immunology and Serology.
8. Describe the basic function of each of the major disciplines of Clinical Laboratory Science: hematology/coagulation, immunohematology, chemistry and microbiology.

**Mercer County Community College Institutional Learning Goals (ILG)**

**Goal 1.** Written and Oral Communication in English: 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 3.** Science: Students will use the scientific method of inquiry, through the acquisition of scientific knowledge.

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

**Goal 5.** Social Science: Students will use social science theories and concepts to analyze human behavior and social and political institutions and to act as responsible citizens.

**Goal 6.** Humanities: Students will analyze works in the fields of art, music, or theater; literature; philosophy and/or religious studies; and/or will gain competence in the use of a foreign language.

**Goal 7.** History: Students will understand historical events and movements in World, Western, nonWestern or American societies and assess their subsequent significance.

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

**Goal 9.** Ethical Reasoning and Action: Students will understand ethical frameworks, issues and situations.

**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.

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

**Weeks of study:**

**Unit 1 Introduction into the Medical Laboratory Profession and Specimen Collection and Handling**

**Learning Objectives**

1. Describe an overview of the practice of a medical laboratory professional. ILG 1, 3
2. List professional societies associated with clinical laboratory science, stating each society’s continuing education policy. ILG 1, 3
3. Review the professional code of ethics for Medical Laboratory Professionals. ILG 9
4. Describe the importance of behavior consistent with the ASCLS Code of Ethics. ILG 1, 5, 9
5. List five steps in one value-based decision-making model. ILG 1, 9
6. Define the terms: accreditation, certification, and licensure. ILG 1
7. Identify CLIA regulations involving clinical lab certification as waived, physician-performed microscopy, moderate or high complexity testing laboratories. ILG 3
8. Demonstrate knowledge and application of the Principles of the Right to Know Act and the Bloodborne Pathogens Act. ILG 3, 9
9. Demonstrate the proper use of safety equipment used in the lab and relate its use in following guidelines set by OSHA for standard precautions. ILG 3
10. Recognize the signs and symbols used to signify potential contact with radiation, carcinogens, poisons, biohazards, and flammable substances. ILG 3
11. Discuss medical ethics, define law, consent, confidentiality, and liability. ILG 1, 3, 9
12. Discuss the skills needed to properly perform venipuncture and capillary blood collection techniques. ILG 1, 3
13. Identify the equipment found on a phlebotomy tray. ILG 3
14. Identify common anticoagulants & additives used to preserve blood specimens. ILG 3
15. Demonstrate knowledge of the color coding system for evacuated tubes. ILG 3
16. Recognize the importance of accurate patient identification, discuss HIPAA and respect patient confidentiality. ILG 1, 3, 9
17. State the difference between informed consent and implied consent. ILG 1, 9
18. Centrifuge a blood sample – understand the terms: hemolysis, lipemia, bilirubinemia. ILG 1, 3
19. Define the term: Point of Care Testing and state examples of test procedures performed at the patient’s bedside. ILG 1, 3
20. Discuss a patient’s bill of rights. ILG 1, 3, 9

**Psychomotor Performance Objectives:**

1. Attend an Information Literacy session developed and presented by the MCCC Library staff. ILG 10
2. Demonstrate the ability to locate reliable primary information resources using a web browser. ILG 4, 10
3. Access the MCCC Library webpage developed for the MLT program. ILG 4, 10
4. Access internet websites for the professional societies of clinical laboratory science. ILG 4
5. Clean bench tops with 10% bleach solution before and after performing clinical laboratory testing. ILG 3
6. Properly perform proper hand washing, gowns, gloving, masking and double bagging technique. ILG 3
7. Observe and discuss techniques for collecting samples from newborns. ILG 1, 3
8. Practice performing venipuncture and capillary procedures applying standard practices and guidelines. ILG 3
9. Review videos on Infection Prevention and Blood Collection Techniques using MediaLab, Inc. ILG 3

**Unit 2**

**Understanding the Quality Practices and Equipment/Technology used in Clinical Laboratory Settings**

**Learning Objectives**

The student learner should be able to:

1. Compare and contrast the function and operation of a hospital laboratory and a research laboratory. ILG 1
2. Identify the metric units of measurement (weight, length, volume, temp.). ILG 3
3. Explain the purpose of using a quality assurance program in the laboratory. ILG 1, 3
4. Compare controls and standards understanding the function of each. ILG 3
5. List the overall function of a Laboratory Information System as it relates to pre-analytic, analytic and post-analytic function in a laboratory. ILG 1, 4
6. Explain the correlation of a LIS interfacing with laboratory instruments and to the Hospital Information System or outreach centers. ILG 1, 4
7. Discuss the purposes that DNA sequencing information is routinely used for in the clinical laboratory. ILG 1, 3
8. State the "central dogma" relating to nucleic acid function. ILG 1, 3
9. List the 4 nitrogen bases for DNA and state which ones pair together. ILG 1, 4
10. State the composition of a: nucleoside, nucleotide, pyrimidine and purine. ILG 1, 3
11. State the 5 carbon sugar of DNA. ILG 1, 3
12. State the direction of DNA synthesis. ILG 1, 3
13. Complete a sequence of nitrogen bases create the complementary strand. ILG 3

**Psychomotor Performance Objectives:**

1. In group settings, establish appropriate professional interpersonal skills and cultural sensitivity as it relates to special situations during the practice of phlebotomy. ILG 5, 8
2. Master venipuncture and capillary procedures using a variety of collection materials (straight needle and winged butterfly sets) ILG 3
3. In timed laboratory practicals, students will perform phlebotomy techniques exhibiting good communication skills. ILG 3
4. Identify the various parts of the compound microscope and describe the function of each part. ILG 3
5. Demonstrate the proper care and maintenance of a microscope. ILG 3
6. Demonstrate the techniques of using flasks, graduated cylinders, pipettes, and centrifuges in the preparation of solutions, aliquots, and dilutions prepared in the clinical laboratory. ILG 3
7. Calculate and perform dilution procedures. ILG 2, 3

**Unit 3**

**The Urinary System**

**Learning Objectives**

The student learner should be able to:

1. Identify the anatomy of the kidney and the physiology of the renal system. ILG 3
2. Explain renal physiology including the principles of filtration, re-absorption and secretion. ILG 1, 3
3. Describe the physical characteristics of urine and correlate abnormal physical characteristics to common clinical conditions or disease. ILG 1, 3
4. Describe the chemical properties of urine that are tested in each area of reagent strip testing. ILG 1, 3
5. Apply the principle of each test strip area and correlate abnormal results with common clinical conditions or disease. ILG 3, 11
6. Recognize, identify, and evaluate organized and unorganized sediment from stained and unstained preps in a urine microscopic exam. ILG 3, 11
7. Correlate physical, chemical, & microscopic findings & recognize discrepancies. ILG 3, 11
8. Identify common kidney diseases and correlate the disease with expected laboratory data results. ILG 3
9. Analyze case studies in urinalysis correlating laboratory data to normal and abnormal clinical diagnosis. ILG 3, 11
10. State the principle of reflectance. ILG 3

**Psychomotor Performance Objectives:**
1. Following standard practices perform the physical, chemical, and microscopic analyses of urinalysis samples. ILG 3
2. Operate a clinical instrument for urinalysis including quality control assessment and recognizing a need for basic maintenance and troubleshooting. ILG 3, 4, 11
3. Identify urinary sediment constituents on kodachrome slide and/or diagrams. ILG 3
4. Perform quality control procedures in urinalysis using control material. ILG 3, 4
5. Review the Clinitek manual for basic troubleshooting of the instrument. ILG 3, 4
6. In timed laboratory practicals, students will perform urinalysis testing and evaluation. ILG 3, 11

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**Unit 4**  
**The Immune System**  
**Learning Objectives**  
**The student learner should be able to:**

1. Discuss and compare the body’s innate and adaptive immune systems. ILG 1, 3
2. Identify characteristics and properties of immunoglobin classes. ILG 3
3. Compare the description and function of cells associated with the immune response. ILG 3, 10
4. State the characteristics and properties of antigens. ILG 1, 3
5. State the characteristics and properties of antibodies. ILG 1, 3
6. Explain the role of the MHC in the immune response. ILG 1, 3
7. Compare the primary and secondary response of immune system. ILG 1, 3
8. Describe the four classifications of hypersensitivity. ILG 1, 3
9. List the components of complement. ILG 1, 3
10. Differentiate between the classical and alternate pathways of complement activation. ILG 3, 10
11. Explain the biological functions of complement. ILG 1, 3
12. Differentiate between active and passive immunity, correlate the types of immunity received from vaccines, toxoids, attenuated bacteria, antitoxins and gamma globulin. ILG 1, 3, 10, 11

**Psychomotor Performance Objectives:**
1. Observe demonstration of ANA procedure and identify positive cells on the fluorescent microscope. ILG 3, 4
2. Distinguish between homogeneous and speckled patterns. ILG 3, 11
3. Demonstrate competency using flocculation and agglutination assay kits to assess patients for the presence of specific diseases such as Rheumatoid Arthritis, Infectious mononucleosis and Syphilis. ILG 3, 4, 11

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**Unit 5**  
**Department-specific Clinical Laboratory Testing**  
**Learning Objectives**  
**The student should be able to:**

**Hematology**

1. Differentiate between serum and plasma and state the approximate percentage of each in a healthy person’s blood. ILG 3
2. Discuss hematopoiesis and differentiate between the formed elements of blood. ILG 1, 3
3. Discuss the preferred specimens for hematology tests. ILG 1, 3
4. Name the tests that are part of the complete blood count and describe the use of each. ILG 1, 3

**Basic Immunohematology (Blood Banking)**
1. Explain the purpose of the blood bank department. ILG 1, 3
2. Describe the procedure used to obtain donor blood units. ILG 3
3. State the four possible components of blood units. ILG 3
4. Name the four blood groups in the ABO system and the frequency of each in the United Stated. ILG 3
5. Name the blood group antigens and antibodies present in each of the four groups. ILG 3
6. Define “Universal Donor” and “Universal Recipient”. ILG 1, 3
7. Explain forward and reverse grouping. ILG 1, 3
8. Explain the importance of the Rh blood group system. ILG 1, 3

Basic Clinical Microbiology
1. List the fields of study included in microbiology. ILG 1, 3
2. Describe the organization of the microbiology department in small and large laboratories. ILG 1, 3
3. Discuss the differences in normal flora, pathogens, and opportunistic pathogens. ILG 1, 3
4. Explain how infection occurs. ILG 1, 3
5. Discuss the three basic shapes of bacteria. ILG 1, 3

Clinical Chemistry
1. List six body fluids that are tested in clinical chemistry. ILG 1, 3
2. Discuss the proper collection and handling of blood specimens for chemical analysis. ILG 1, 3
3. Discuss six blood collection problems that may interfere with test results. ILG 1, 3
4. Explain how the blood level of some chemical substances varies according to the time of day. ILG 1, 3
5. List 15 constituents commonly assayed in a chemistry profile. ILG 1, 3
6. Explain the significance or function of each of the constituents commonly included in a chemistry profile. ILG 1, 3

Psychomotor Performance Objectives:
1. Given a sample of red blood cells correctly perform the ABO typing procedure. ILG 3, 11
2. Given the results of an ABO typing correctly interpret the results. ILG 3, 11
3. Prepare at least three slide smears which are even, smooth and have an acceptable feathered edge. ILG 3
4. Correctly utilize the four quadrant streak method to plate microorganisms. ILG 3, 11
5. Understand the importance of POCT assays and discuss the principle of some of different types of waived POCT assays: glucometer, fecal occult blood test, etc. ILG 3, 4, 11

Laboratory Competency Skills
During the laboratories, measures are in place to assess the student’s cognitive, affective and psychomotor domains. Specifically, the student’s mastery of procedural theory and entry-level laboratory techniques will be evaluated using pre-labs, in-lab assignments, timed laboratory practicals, and case studies. The affective domain will be evaluated weekly and is based on the student’s ability to meet specific professional behavior criteria.

Course Projects
a. Lecture-Ethics Paper (Schedule with Martin Crabtree)
   i. This course project is work 10% of your Lecture Grade. Summarize a professional peer-reviewed journal article on the topic of medical ethics. Try to use one of the ethical rationales discussed in lecture (autonomy, justice, beneficence, non-maleficence). The article must be from a professional medical journal, published within the past 5 years.

b. Lab-CLS Tour Paper (CentraState or Capital Health or Penn Medicine Princeton)
   i. This course project is worth 10% of your laboratory grade. The project entails visiting a clinical laboratory science facility and creating a minimum 2 page-typed summary. There is specific, required information that must be included. Please READ THE ENTIRE DOCUMENT prior to visiting the clinical lab. All those students who are within range of Mercer County, NJ will have their tour arranged by the instructor of this course. Students who are not able to attend this tour will need to speak with the instructor with alternate arrangements.

Affective Objectives
Affective objectives are behavioral standards that will be implemented during the professional phase of the Medical Laboratory Technology Program. Students’ professional performances will be evaluated during the laboratory course and will be returned to the student with their all laboratory worksheets submitted. This has a direct effect on the final letter grade earned. See below for a detailed list of the criteria.

Unsatisfactory performance in any area of the behavioral standards will require a consultation with the faculty and/or the MLT Program coordinator. The reason for the consultation will be clearly stated, counsel will be given and an action plan will be implemented. The student will be given the opportunity to give a written response. The consultation form will be kept in the student’s file.
PROFESSIONAL PERFORMANCE 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 or 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.

Scoring: Total number of possible points= # of weeks x # of categories X 2 (Greatest achievable score) =n Achieved points = student scores:

Total of numbers each week (#2s + #1s+ #0s)

Cut off values: Upper cut-off value=0.675n; lower cut-off value= 0.425n

How your Final Grade can be Affected
If a>0.675n, then the course grade is increased one step (e.g., from C to C+)
If a is between 0.425n and 0.675n, then the course grade is unaffected (e.g. C remains C) If a<0.425(n), then the course grade is decreased one step (e.g. C to C-).
If course grade remains within range: student will receive full credit for affective score
**Grading**

To receive a passing grade, students must earn a 77 or higher. A final grade of 77 or higher is required in each Medical Laboratory Technology course in order to progress to the next MLT course and to graduate. No make-up exams are to be given unless there are extenuating circumstances.

- **A**  93-100%
- **A-**  90-92
- **B+**  87-89
- **B**  83-86
- **C+**  77-79
- **B**  83-86
- **D**  70-76
- **F**  0-59%

**Lecture (2/3 of grade)**

- Writing Project 10%
- Assignments 20%
  - Homework
  - Weekly Quizzes
  - Case Studies
- Two Exams 15%
- Midterm 25%
- Final 30%

100% x .67 = Lecture Percentage

**Laboratory (1/3 of grade)**

- Laboratory Exercises (Pre-Labs/HWs) 20%
- Competencies 20%
- Midterm Assessment/Practical 25%
- One Practical Exam (Comprehensive) 35%

100% x .33 = Lab Percentage

Final Total Grade = Lecture Percentage + Lab Percentage

**Extra credit** work will not generally be recognized in evaluating student performance; however, individual instructors have limited flexibility in recognizing additional effort by an individual student. For this course, **there is NO EXTRA CREDIT opportunities.**

**Late work**

- 5 points will be deducted for each day the assignment is late, up to 5 days. Assignments submitted 6 or more days late will be graded and returned to the student, but the grade awarded will be “0”.
- **THERE ARE NO MAKEUP EXAMS** (including online and in-person). Except in extreme cases of sickness (contagion or hospitalization, etc.) or death of an immediate family member (father, mother, grandparent, sibling, spouse, or child). Students must provide supporting documentation before the make-up will be administered. It is the responsibility of the student to contact the instructor for make-up exams/ and to provide the documentation.

**Progression in the MLT Professional Courses**

As noted in the MLT Program handbook, a final grade of a C+ or better in each Medical Laboratory Technology course is necessary to progress to the next professional phase course.

**Unsatisfactory Performance**

Unsatisfactory performance in any area (cognitive, psychomotor or affective), failure to follow directions or procedures, unsafe or unethical behavior, or failure to keep a grade of 77 or above in the course will require a consultation with the faculty and/or the MLT Program coordinator. The reason for the consultation will be clearly stated, counsel will be given and an action plan will be implemented. The student will be given the opportunity to give a written response. The consultation form will be kept in the student’s file and progress must be made by following the plan of action.
Discussions
Although not explicitly graded, you will be evaluated on the QUALITY of your contributions and insights. Quality comments possess one or more of the following properties:

- Offers a different and unique, but relevant, perspective;
- Contributes to moving the discussion and analysis forward;
- Builds on other comments;
- Transcends the “I feel” syndrome. That is, it includes some evidence, argumentation, or recognition of inherent tradeoffs. In other words, the comment demonstrates some reflective thinking.

Follow proper online discussion etiquette: Online Discussion Etiquette Guide

Discussion Rubric
You must post an initial thread in response to the Discussion topic and comment on at least 2 other students to receive full credit. See below for the rubric image. The most amount of points awarded for each discussion is 3 points. 3 pts=100%

You must post an initial thread in response to the Discussion topic and comment on at least 2 other students to receive full credit. See below for the rubric image. The most amount of points awarded for each discussion is 3 points. 3 pts=100%

Note: Please use the following FORMAT as the SUBJECT LINE FOR YOUR INITIAL DISCUSSION which must be posted by WEDNESDAY of each week. “LASTNAME.WEEK__DISCUSSION”

Example= SHAVE.WEEK 1 DISCUSSION
SHAVE.WEEK 2 DISCUSSION

Thank you for your cooperation. Failure to comply with this may limit the Professor’s ability to grade you fairly.

Communication between Student and Instructor
Instructor role:
- Blackboard Announcements will be posted by the instructor in the Announcement Page of the course. This announcement will forever appear on this page. A copy of the message is also sent to your MercerMail.
- Email Communication: As previously mentioned, all communication will be sent to your MercerMail account.

Student role:
- Students are expected to check their Mercermail at least once daily M-F and once during the weekend for important course related messages (announcements and emails from the instructor).
- Blackboard Announcements: students should be sure to check their email as well as the Blackboard section each time they sign on to the course.
- Immediate, specific, personal questions for the instructor: Students can send a message through Blackboard using the Course Messages link on the tab to the left in the course or write an email using your MercerMail.
Turnaround Time (Instructor to Student)

- **Questions (Non-assignments):**
  You can expect all correspondence sent via email using your MercerMail to your instructor to be responded to within 24 hours Monday through Friday. The instructor will notify the class if there will be longer periods of time where responses may be delayed.

- **Assignments/Exams/Grades**
  Turnaround times for papers, journals, essays, short-answer questions and other manually graded written assignments will be graded within one week after the due date. Grades will be posted to BlackBoard LMS.

**Attendance**

Attendance and participation at all classes is consistent with academic success. In addition, today’s health care employer puts great emphasis on attendance and often times request to see a referral from this program concerning your attendance record.

- **Face-to-Face Lecture Policy**
  - Students are expected to attend all lecture sessions. If an extenuating absence is anticipated, please e-mail shavel@mccc.edu or call/leave a message at my office 609-570-3387. Please leave a message if your call forwards to voicemail. Absence from class, even if called in, must be for a legitimate reason; otherwise the absence will be counted as unexcused. The student is responsible for any material missed. For any missed labs, the student will receive a zero as a participation and any assignments that were due that or handed out on that day.
    - **Excessive absence**- If a student misses more than 10% of the meeting days, they must report to a mandatory consultation with the Instructor to develop a corrective action plan.
      - A student must follow this plan. If the student continues to miss more than 20% of a course’s meeting days or does not follow the action plan, the student will be dismissed from the course with a W or receive a grade of F if the course is past the college’s withdrawal period.
    - **Lateness/Exits**- Students are allowed two (2) unexcused lateness’s or exits from class. Each additional lateness or exit will result in a half a letter grade deduction. Lateness is defined as appearing for class 10 minutes or more after the start of the scheduled Session. Exit is defined as leaving a class for 10 minutes or more while it is in progress and returning, or leaving early from a class that is in progress.

- **Face-to-Face Laboratory**: Students MUST attend all Weekly Laboratory classes. There are NO makeups.
  - **Excessive absence**- If a student misses more than 10% of the meeting days, they must report to a mandatory consultation with the Instructor to develop a corrective action plan.
    - A student must follow this plan. If the student continues to miss more than 20% of a course’s meeting days or does not follow the action plan, the student will be dismissed from the course with a W or receive a grade of F if the course is past the college’s withdrawal period.
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- **Withdrawn Immediately**
  - If you miss a full week of laboratory sessions, you may be withdrawn from the course with a W or receive a grade of F if the course is past the college’s withdrawal period.

The Department reserves the right to require written verification for absences. Students absent or late without notifying the Department are considered unexcused and are subject to the policies stated above.

**Student complaints & Grade disputes:**
The student has a right to appeal the decision of the instructor or the Academic Integrity Committee. Judicial procedures governing violations of Academic Integrity are contained in the Student Handbook. Approved by the MCCC Board of Trustees March 18, 2004

**Academic Integrity Violations for On-Campus and Hybrid students**

The college recognizes the following general categories of violations of academic integrity, with representative examples of each. Academic integrity is violated whenever a student:

A. **Uses or obtains unauthorized assistance in any academic work.**
   - copying from another student's exam
   - using notes, books, electronic devices or other aids of any kind during an exam when prohibited.
   - stealing an exam or possessing a stolen copy of an exam

B. **Gives fraudulent assistance to another student.**
   - completing a graded academic activity or taking an exam for someone else
   - giving answers to or sharing answers with another student before, during or after an exam or other graded academic activity.
   - sharing answers during an exam by using a system of signals

C. **Knowingly represents the work of others as his/her own, or represents previously completed academic work as current.**
   - submitting a paper or other academic work for credit which includes words, ideas, data or creative work of others without acknowledging the source.
   - using another author's words without enclosing them in quotation marks, without paraphrasing them or without citing the source appropriately.
   - presenting another individual's work as one's own.
   - submitting the same paper or academic assignment to another class without the permission of the instructor.

D. **Fabricates data in support of an academic assignment.**
   - falsifying bibliographic entries
   - submitting any academic assignment which contains falsified or fabricated data or results

E. **Inappropriately or unethically uses technological means to gain academic advantage**
   - inappropriately or unethically acquiring material via the Internet or by any other means.
   - using any electronic or hidden devices for communication during an exam.

Each instructor and Academic Student Resources area is authorized to establish specific guidelines consistent with this policy.

“Online students are held to the same level of accountability as students in a traditional classroom. As such, all online students should become familiar with and strictly adhere to MCCC's Academic Integrity policies, which can be found at [www.mccc.edu/academic_policies_integrity](http://www.mccc.edu/academic_policies_integrity).

Furthermore, MercerOnline at Mercer County Community College provides each student with a unique username and password whereby students may access their online courses and complete work assigned therein. It is the responsibility of each student to keep these login credentials confidential. Sharing of login credentials with any individuals other than the course instructor or members of the MercerOnline staff is a grave violation of academic integrity policies and poses a risk to the security of their online course. Students who fail to maintain the confidentiality of their login credentials and thus compromise the security of the online course environment will be subject to disciplinary action.”

**Consequences for Violations of Academic Integrity**

For a single violation, the faculty member will determine the course of action to be followed. This may include assigning a lower grade on the assignment, assigning a lower final course grade, failing the student in the course, or other penalty appropriate to the violation. In all cases, the instructor shall notify the Chair of the Academic Integrity Committee of the violation and the penalty imposed. When two (or more) violations of academic integrity are reported on a student, the Academic Integrity Committee (AIC) may impose disciplinary penalties beyond those imposed by the course instructors. The student shall have the right to a hearing before the AIC or a designated AIC subcommittee.

**MediaLab, Inc.**

All students have a free subscription to MediaLab, Inc. which will be utilized for the purpose of enhancing concepts and skills learned each week. Students have already been granted access and should keep their username and password private. All
assigned MediaLab courses must be completed by the deadline. A passing grade of 70% is required in order for the course to be deemed successful. Students may attempt a course twice. Please reach out to the instructor if you’d like to reattempt so that permission can be granted.

Cellular Telephones, Personal Telephone Calls, and Electronic Devices
Students are NOT to receive or place telephone calls or text messages during class, labs, or clinical hours. Cellular telephones and other electronic devices are to be silenced before entering the classroom, student laboratory, or the clinical site. Inappropriate use of any electronic device may result in disciplinary action. Students wishing to take pictures or record a Professor’s instruction must be granted approval to do so.

Reasonable Accommodations for Students with Documented Disabilities
Mercer County Community College is in compliance with both the ADA and Section 504 of the Rehabilitation Act. If you have, or believe you have, a differing ability that is protected under the law please see Arlene Stinson in LB216, (609) 570-3525, stinsona@mccc.edu for information regarding support services. These accommodations must be made PRIOR to the start of the course.

Equal Opportunity Policy
Mercer County Community College is committed to equal opportunity and affirmative action. Discrimination on the basis of race, creed, color, national origin, ancestry, age, gender, affectional or sexual orientation, marital status, familial status, liability for service in the Armed Forces of the United States, nationality, political views, religion, disability unrelated to job or program requirements or any other characteristic protected by law is prohibited. Questions regarding the equal opportunity policy and compliance statement may be directed to the Affirmative Action Officer, West Windsor Campus, (609) 586-4800, ext. 3270
<table>
<thead>
<tr>
<th>Week</th>
<th>Day</th>
<th>Topic</th>
<th>Lecture Readings</th>
<th>Lecture Exams/Quizzes &amp; Assignments</th>
<th>Laboratory Procedures</th>
<th>Laboratory Competency &amp; Assignments Note:</th>
</tr>
</thead>
</table>
| 1    | Tues 5/21/19  | • Intro to MLT Profession  
1. Fundamentals of the Clinical Lab  
2. Medical Ethics  
LB106 1:00-3:00pm   |                      | Lab HW must be handwritten and handed in at the beginning of lab |
|      | Thurs 5/23/19 | • Phlebotomy: Specimen Collection, Handling & Processing | Chapter 4        | Week 1 HW due  
Week 1 Lecture Quiz due by Sun 1159p | 1. Handwashing/IP  
2. Capillary Puncture  
3. Microcollection  
4. Venipuncture | Quiz 1 (Safety Manual) |
| 2    | Tues 5/28/19  | • Understanding the Quality Practices  
1. Quality Assessment/Quality Control  
2. The Microscope  
3. Measurement and Equipment  
4. Lab Math and Solution Prep | Chapter 3  
Chapter 5  
Chapter 6  
Chapter 7 | 1. Interpersonal Skills  
2. Phlebotomy  
- Straight needle  
- Winged set | HW due |
|      | Thurs 5/30/19 | Basic and Contemporary Techniques  
• Laboratory Information Systems  
• Molecular Basics | Chapter 8  
Ch. 9 (p222-235) | Week 2 HW Due  
Week 2 Lecture Quiz due by Sun 1159p | 1. Specimen Processing  
2. Centrifuge Intro | Phlebotomy Competency |
| 3    | Tues 6/4/19   | • The Urinary System  
1. Renal Physiology  
2. Macroscopic Urinalysis  
- Physical & Chemical Analysis of Urine  
- Confirmatory Tests | Chapter 13 | 1. Urine Specimens  
2. Quality Control  
3. Macroscopic Exam  
- Manual  
- Automated  
4. Confirmatory Tests | HW due  
Quiz 2 (Week 2) |
|      | Thurs 6/6/19  | 3. Microscopic Properties of Urine  
4. Clinical Pathologies/Case Studies | Chapter 13 | Week 3 HW due  
Optional Week 3 Lecture Quiz due by Sun 1159p | 1. Microscope Training  
2. Complete UA  
- Automated w/ the addition of the Microscopic Analysis | |
| 4    | Tues 6/11/19  | • The Immune System & Immune Response  
(Will be covered after Lecture Midterm) | Chapter 16 | Week 4 HW Due  
Week 4 Lecture Quiz due by Sun 1159p | Assays for Diseases  
1. ANA Testing  
2. Precipitation  
3. Flocculation  
4. Agglutination | Urinalysis Competency |
|      | Thurs 6/13/19 | • Principles of Immunological & Serological Methods | Chapter 16 |   | Optional BB Webinar 1-2p | |
| 5    | Tues 6/18/19  | • CLS Testing by Department  
1. Hematology/Hemostasis  
2. Immunohematology  
3. Clinical Microbiology | Chapter 11/12  
Chapter 17  
Chapter 15 | 1. Slide-Making  
2. Intro to Blood Typing (Slide method)  
3. Plate Streaking | HW due  
Quiz 2 (Week 4 Thur) | |
|      | Thurs 6/20/19 | 4. Clinical Chemistry  
5. POCT and Automation | Chapter 10  
Chapter 9 |   | CLS TOUR | |
| 6    | Tues 6/25/19  | Lecture Final (9:00am) Comprehensive Exam  
Optional Lab Review Session |   |   |   | |
|      | Thurs 6/27/19 | CLS Tour Paper Due  
Lab Final (1:00pm) Comprehensive Exam |   |   |   | |
## MLT112 Introduction to Medical Laboratory Technology
### HYBRID SAMPLE SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Begins &amp; Ends on Sundays</th>
<th>Topic</th>
<th>Lecture Readings</th>
<th>Lecture Exams/Quizzes &amp; Assignments</th>
<th>Laboratory on Wednesdays Procedures &amp; MediaLab, Inc.</th>
<th>Laboratory Competency &amp; Assignments</th>
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</thead>
</table>
| 1    | Mon 5/20/19 thru Sun 5/26/19 1159p (ET) | • The Medical Lab Profession and Medical Ethics  
1. Introduction to the Clinical Lab  
2. Medical Ethics  
3. Sources of Information: Healthcare Accrediting and Credentialing agencies, Professional Societies and Governmental Agencies  
• Theory and Practice of Phlebotomy  
1. Specimen Collection, Handling & Processing  
   - Capillary Puncture  
   - Venipuncture  
  Unit 1 Lesson 1-1  
  Lesson 1-2  
  Appendix D  
  Unit 1 Lesson 1-11  
  Lesson 1-12 | Unit 1  
Lecture  
Exams/Quizzes &  
Assignments  
Everything is due by Sunday 1159p ET on Blackboard | Wednesday May 22nd  
9:00a-11:45a  
1. Handwashing/IP  
2. Capillary Puncture  
3. Microcollection  
11:45a-12:30p break  
12:45p-3p  
4. Venipuncture | 9a-9:30a  
Safety Manual Quiz |
| 2    | Sun 5/26/19 thru Sun 6/2/19 1159p (ET) | • Lab Safety, Equipment/Technology, Laboratory Math and Quality Practices  
QA/QC  
1. Biological Safety  
2. Chemical, Fire, and Electrical Safety  
3. General Laboratory Equipment  
4. The Metric System  
5. Lab Math and Reagent Prep  
6. Quality Assessment  
7. The Microscope  
8. Infection Prevention in Healthcare  
  Unit 1 Lessons  
1-4 to 1-10  
  Unit 7 Lesson 7-9 | Week 2 HW due on the dropbox on Blackboard by Sun night  
Week 2 Lecture Quiz due by Sun night | Wednesday May 29th  
8:30a-9a Recitation  
9a-11:45a  
1. Interpersonal Skills  
2. Phlebotomy  
   - Straight needle  
   - Winged set  
11:45a-12:30p break  
12:30p-1:30p  
3. Specimen Processing  
4. Centrifuge Intro | HW due by 9am Wednesday  
1:30p-3p Phlebotomy Competency |
| 3    | Sun 6/2/19 thru Sun 6/9/19 1159p (ET) | • The Urinary System  
1. Introduction to Urinalysis  
2. Urine Collection and Processing  
3. Macroscopic UA  
   - Physical Examination of Urine  
   - Chemical Examination of Urine  
   - Confirmatory Tests  
5. Microscopic Properties of Urine  
4. Clinical Pathologies/Case Studies  
  Unit 5 Lessons  
5-1 to 5-5 | Week 3 Lecture Quiz due by Sun night | Wednesday June 5th  
8:30a-9a Recitation  
9a-11:45a  
**Quiz 1**  
1. Urine Specimens  
2. Quality Control  
3. Macroscopic Exam  
   - Manual  
   - Automated  
4. Confirmatory Tests  
11:45a-12:30p break  
1p-3p  
CLS Tour at Princeton Medical Center | HW due by 9am Wednesday  
**Quiz 1**  
1. Urine Specimens  
2. Quality Control  
3. Macroscopic Exam  
   - Manual  
   - Automated  
4. Confirmatory Tests  
11:45a-12:30p break  
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CLS Tour at Princeton Medical Center |
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<th>Week</th>
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<tr>
<td>4</td>
<td>Sun 6/9/19 thru Sun 6/16/19 1159p (ET)</td>
<td><strong>Basic Immunology</strong>&lt;br&gt;Unit 4 Lessons 4-1 to 4-4&lt;br&gt;Week 4 Lecture Quiz due by Sun night&lt;br&gt;Wednesday June 12th 8:30a-9a Recitation 9a-11:45a Quiz 2 1. Microscope Training 2. Complete UA - Automated w/ the addition of the Microscopic Analysis 11:45a-12:30p break 12:30p-3p Assays for Diseases 1. ANA Testing 2. Precipitation 3. Flocculation 4. Agglutination</td>
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