

NORTHEAST TEXAS COMMUNITY COLLEGE
MLAB 1201
INTRODUCTION TO CLINICAL LABORATORY SCIENCE SYLLABUS
Fall 2019

INSTRUCTOR INFORMATION

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Office Hours: Mon: 9 am – 12:30
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By appt

COURSE INFORMATION

Lecture:	Mon. 1:00-1:50 PM	Meets in UHS 221
Laboratory:	Mon. 2:00-3:50 PM	Meets in UHS 226

Course Description: This course is an introduction to the principles and procedures of clinical laboratory science. The course introduces the concepts and/or techniques of quality control, laboratory math, safety, basic laboratory equipment, laboratory settings, accreditation, certification, professionalism and ethics.

Course Goals and Objectives: The primary goal of this course is to provide students with an understanding of the basic theory, procedures, skills and techniques required for understanding and performing routine laboratory tests. Upon completion of this course, the student should be able to do the following:

- ❖ Exhibit an understanding of safety hazards in the laboratory and demonstrate laboratory safety
- ❖ Perform laboratory math; calculate concentrations of dilutions and solutions
- ❖ Describe quality control procedures according to established protocol and evaluate results
- ❖ Demonstrate the use of basic laboratory equipment
- ❖ Explain accreditation and certification
- ❖ Describe the role of the medical laboratory technician as a health care professional
- ❖ Exhibit the professional and ethical attributes required by the medical laboratory technician
- ❖ Exhibit an understanding of the basic laboratory procedures.

Method of Instruction: The Introduction to Clinical Laboratory Science course utilizes a variety of instructional methods, including reading assignments, lectures, laboratory experiments and practice, computer-aided instruction and written assignments. Students are responsible for all reading assignments, lecture material, laboratory and other assignments.

Scan Competency	Introduction to Clinical Laboratory Science
Resources	Identify reagents and supplies needed for each lab and organize laboratory procedure so that reagents, supplies and equipment are utilized correctly.
Interpersonal	Recognize limitations of expertise and communicate with instructor when questions arise. Show respect for instructor and peers during class time.
Information	Apply information gained from lecture, laboratory, internet, and independent study to acquire relevant information to specific topics that relate to clinical laboratory science.
Systems	Apply critical thinking skills to clinical laboratory problems.
Technology	Use computers and the internet to access course materials and other relevant course information.

Required Text: Estridge, B.H. and A.P. Reynolds. *Basic Clinical Laboratory Techniques*, 6th Edition, Thomson Delmar Learning, 2008.

Additional Resources: Powerpoint lectures and additional internet material

Classroom Expectations:

1. Attend all classes and labs, be on time and remain in class for the entire period. **For every three days missed, one letter grade will be deducted from the final grade. Three episodes of tardiness or early departure will be equated with one class absence.**
2. Complete assigned readings *before* the lecture over each topic.
3. Be prepared to take notes and participate in class.
4. Be respectful of instructors and classmates.
5. Turn off cell phones and pagers.
6. Laptops may be used for note-taking but do not abuse this privilege. They are not for personal use during class time.

Examinations:

All class examinations are considered to be a major part of the course work upon which a major portion of your final grade will be based. Class exams are listed on the class calendar. If this calendar must be altered, the change will be announced in class. **If you have a conflict with the date, you must contact me well in advance of the examination. Failure to do so will result in an examination grade of zero. A grade of zero will be assigned for any missed unannounced quizzes.**

Illness or Emergencies:

When illness or emergencies arise which necessitate a student's absence from any scheduled class or other scheduled activity, the instructor should be notified as soon as possible.

Missing Scheduled Tests and Exams:

A student who is absent on the day of a scheduled test or examination must contact the instructor **prior to the end of the day which the test or exam was scheduled in order to receive full**

credit. The student should be prepared to take the test on the first day he/she returns to campus or at the earliest convenience of the instructor. The test or examination grade will be lowered 10 percentage points for each class day which lapses until the student makes arrangements to take the test/exam.

Students are expected to take the final exam on the scheduled day. If a student is unable to take the exam on the scheduled day, arrangements must be made prior to the scheduled exam date in order to receive any credit on the scheduled retake examination.

Students are expected to arrive on time for scheduled tests and exams. Students who know they are going to be late for or miss a scheduled test or exam must notify the instructor prior to the start of the test. A student who arrives more than 15 minutes late will not be seated for the test or exam and will follow the same make-up policy as described above. A student who arrives more than 15 minutes late will not be seated for the FINAL exam and will be given a zero (0).

Assignments:

All assignments are due on the specified due date. Assignments will be accepted, but marked as late three (3) days following the due date. No assignment will be accepted after graded assignments are returned. Late assignment scores will be reduced by 10%. No late assignments will be accepted the last week of the school schedule.

Academic Dishonesty:

Academic dishonesty is considered an act of cheating. Each student has a responsibility to follow the college policies regarding academic dishonesty which are found in the Student Support and Outreach Services section of the Northeast Texas Community College General Catalog. These policies include but are not limited to:

1. Giving or receiving information about the content of quizzes, examinations, or other specified assignments.
2. Plagiarism
3. Copying or using unauthorized information or materials on quizzes, exams or other assignments.

Any student in violation of this policy will automatically receive a grade of "0" for that assignment. A second violation will result in suspension from the program.

Students with Disabilities:

Northeast Texas Community College complies with Section 504 and the American with Disabilities Act. Students with disabilities who require special accommodations should contact the Disabilities Coordinator at the beginning of each semester.

Lecture Grade (75%):

4 Exams

appx. 200 pts.

Grading ScaleA $\geq 90\%$

B 80-89%

C 70-79%

D 60-69%

F <60%

Laboratory grade (25%):

Attendance/participation

Procedures/homework

A minimum grade of "C" is required for BOTH the lecture and laboratory components of all Medical Laboratory Technology courses. Failure to meet the minimum passing score in each area will result in a "D" for the course and dismissal from the program

OBJECTIVES FOR MLAB1201 (Introduction to Clinical Laboratory Science)**Unit 1: The Clinical Laboratory**

Lessons 1-1 Objectives:

- Discuss the organization of a typical hospital laboratory.
- List the major departments of a typical clinical laboratory
- Name a test that would be performed in each department
- List three examples of nonhospital clinical laboratories
- Explain how clinical laboratories are regulated
- Explain the relationship between CMS and CLIA'88
- Explain how HIPAA affects the laboratory and laboratory workers
- Explain the purpose of proficiency testing
- Define
 - Accessioning
 - Bacteriology
 - Blood bank
 - CDC
 - Clinical chemistry
 - CLSI
 - Coagulation
 - Hematology
 - Immunochemistry
 - Immunology
 - Microbiology
 - Mycology
 - Parasitology
 - Pathologist
 - plasma
 - POCT
 - Serology

- Serum
- Virology

Lesson 1-2 Objectives

- Explain the functions of accrediting agencies and credentialing agencies
- Explain the purpose and benefits of professional societies
- Discuss rules and importance of ethical conduct for laboratory professionals

Lesson 1-3 Objectives

- Define
 - Abbreviation
 - Acronym
 - Prefix
 - Stems
 - Suffixes
 - Prefixes listed in lesson 1-10 (p. 36-37)
 - Stem words listed in lesson 1-11 (p. 37-38)
 - Suffixes listed in lesson 1-12 (p. 39)
 - Abbreviations and acronyms listed in lesson 1-13 (p. 39-41)

Lesson 1-4 Objectives

- List three classifications of laboratory hazards
- Describe proper laboratory dress and work habits
- Explain engineering controls and give examples
- Explain work practice controls and give examples
- Define:
 - Carcinogen
 - Caustic
 - Centrifuge
 - Fume hood
 - Aerosol
 - Alimentary tract
 - Biohazard
 - Biological safety cabinet
 - Bloodborne pathogens
 - Disinfectant
 - Exposure control plan
 - Isolation
 - Nosocomial
 - Parenteral
 - Pathogenic
 - Standard precautions
 - Sterilization

Lesson 1-5 Objectives

- Explain the “right to know” provisions of OSHA
- List the types of PPE and describe their proper use
- List the five components of a chemical hygiene plan
- List three types of fires and describe the proper use of fire extinguishers
- Describe a material safety data sheet
- Explain the use of chemical labels and describe the NFPA format

Lesson 1-6 Objectives

- Explain the differences between critical and noncritical measurements
- Identify glassware that can be used for critical measurements
- Identify volumetric pipets and explain their proper use
- Identify graduated pipets and explain their proper use
- Measure and transfer liquids using pipets and micropipetters
- Explain the proper use of a centrifuge
- List four rules for using a laboratory balance
- Explain the importance of performing regular equipment maintenance
- Define
 - Beaker
 - Flask
 - Graduated cylinder
 - Meniscus
 - Micropipette
 - Pipet
 - Reagent
 - Solute
 - Solvent
 - TC
 - TD

Lesson 1-7 Objectives

- Name common prefixes used to denote small and large metric units
- Convert units within the metric system
- Define:
 - Centi
 - Deci
 - Gram
 - Kilo
 - Liter
 - Meter
 - Micro
 - Milli
 - Nano
 - NIST
 - Pico

Lesson 1-8 Objectives

- Name three types of reagent water, and explain how they are made
- Prepare percent solutions
- Prepare a reagent using proportion or ratio
- Prepare dilutions of a reagent
- State the formula for preparing a dilute solution from a concentrate
- Perform serial and compound dilutions
- Define
 - Diluents
 - Dilution
 - Dilution factor
 - Percent solution
 - Physiological saline
 - Proportion
 - Ratio
 - Solute
 - Solution
 - Solvent
 - Titer

Lesson 1-9 Objectives

- Explain the importance of quality assessment programs in the laboratory
- Discuss the use of standards and controls
- Explain the difference between accuracy and precision
- Determine the mean value for a given set of test results
- Calculate the standard deviation for an analytical method
- Detect a result that is out of control
- Explain how to detect the development of a trend in a method
- Explain and calculate the coefficient of variation
- Define
 - Average
 - Blind sample
 - Calibration
 - Gaussian curve
 - Levey-Jennings charts
 - Mean
 - Population
 - Quality control
 - Random error
 - Sample
 - Shift
 - Standard
 - Systematic error
 - Variance
 - Westgard's rules

Lesson 1-10 Objectives

- Locate and name the parts of a light microscope
- Explain the function of each part of the light microscope
- Explain the use of coarse and fine adjustments
- Define
 - Binocular
 - Köhler illumination
 - Monocular
 - Ocular
 - Working distance

Lesson 1-11 Objectives

- Explain why a capillary puncture might be performed
- Identify suitable sites for capillary punctures
- Choose and prepare a site for capillary puncture
- Discuss how collection procedures affect capillary specimen quality
- Define
 - Capillary
 - Capillary action
 - Heparin
 - Lancet
 - Lateral

Lesson 1-12 Objectives

- Explain the venipuncture procedure
- Select the equipment necessary to perform a venipuncture
- Explain the application of the tourniquet and selection of a proper venipuncture site
- Discuss factors that can affect the quality of the blood sample obtained by venipuncture
- Name three common anticoagulants in vacuum tubes and their purpose
- Define
 - Basilica vein
 - Cephalic vein
 - Gauge
 - Hematoma
 - Hemoconcentration
 - Hemolysis
 - Lumen
 - Median cubital vein
 - Palpate
 - Phlebotomy
 - Tourniquet
 - Vein
 - Venipuncture

Tentative Lecture/Laboratory Schedule:

Date	Lecture Topic	Laboratory
August 26	Introduction to MLT program	Laboratory Orientation
September 2	Introduction to the Clinical Laboratory and The Clinical Laboratory Professional (Lessons 1-1 and 1-2)	Labor Day
September 9	Medical Terminology (Lesson 1-3)	None
September 16	Exam I (Lessons 1-1 – 1-3) Biological Safety and Chemical, Fire, and Electrical Safety (Lessons 1-4 and 1-5)	Laboratory Safety Check
September 23	General Laboratory Equipment (Lesson 1-6)	None
September 30	The Metric System (Lesson 1-7)	None
October 7	Exam II (Lessons 1-4 – 1-7) Laboratory Math and Reagent Preparation (Lesson 1-8)	Dilutions and Reagent Preparation
October 14	Quality Assessment (Lesson 1-9)	QC Chart Analysis
October 21	Exam III (Lessons 1-8 and 1-9) The Microscope (Lesson 1-10)	Using the Microscope
October 28	Capillary Puncture (Lesson 1-11)	Finger stick
November 4	Vacutainer Tubes and Routine Venipuncture (Lesson 1-12)	Venipuncture
November 11	Routine Venipuncture (Lesson 1-12)	Venipuncture
November 18	Routine Venipuncture (Lesson 1-12)	Venipuncture
November 25	THANKSGIVING HOLIDAY	None
December 2	Routine Venipuncture (Lesson 1-12)	Venipuncture
December 9	Exam IV (Lessons 1-10 – 1-12)	Lab Practical