



**NORTHEAST TEXAS**  
COMMUNITY COLLEGE

## **MLAB 2221 211 HY – Molecular Diagnostics for Clinical Laboratory Science**

Course Syllabus: Spring 2026

*“Northeast Texas Community College exists to provide personal, dynamic learning experiences empowering students to succeed.”*

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<b>Weekday</b>	<b>Office Hours</b>
Monday	By appointment
Tuesday	1:00 PM – 5:00 PM
Wednesday	10:00 AM – 4:30 PM
Thursday	By appointment
Friday	By appointment

**This syllabus serves as the documentation for all course policies and requirements, assignments, and instructor/student responsibilities.**

Information relative to the delivery of the content contained in this syllabus is subject to change. Should that happen, the student will be notified.

### **Course Description:**

Lecture/Lab/Clinical: Three hours of online lecture and three hours of lab each week. A comprehensive overview of the fundamental principles of clinical molecular diagnostics and explores the use of molecular techniques in the diagnosis of disease.

Prerequisite(s): Admission to the MLT program or department approval.

### **Student Learning Outcomes:**

1. Describe the basic structure of DNA and RNA.
2. Describe the basic process of DNA replication.
3. Perform DNA extraction on a clinical specimen.
4. Demonstrate an understanding of basic molecular diagnostic techniques.
5. Demonstrate an understanding of electrophoresis in the separation of DNA fragments.
6. Apply molecular diagnostic techniques to the identification and diagnosis of diseases.

### **Evaluation/Grading Policy:**

*The breakdown of the course requirements is as follows:*

*Lecture Grade:*

Lecture Grade Component	Weight (%)
4 Exams	20% each
Quiz Average	20%

*Laboratory Grade:*

Lab Grade Component	Weight (%)
Lab Participation	50%
Homework, MediaLab Quiz Average	50%

*Final Grade: 75% lecture grade, 25% lab grade.*

*Semester grades will be earned as follows*

Percentage	Letter Grade
90% and above	A
80 %–89%	B
70 %–79%	C
60%–69 %	D
59.9% and below	F

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

**Required Instructional Materials:**

Laptop, PowerPoints, lectures and additional resource materials on Blackboard.

**Optional Instructional Materials:**

Buckingham, L. (2019). *Molecular diagnostics: Fundamentals, methods, and clinical applications* (3<sup>rd</sup> ed.). F.A. Davis Company.

**Publisher:** F. A. Davis Company

**ISBN Number:** 9780803699540, 9780803668294

## **Minimum Technology Requirements:**

### Computer

Most Windows or Mac desktop and laptop computers work well for online classes.

Chromebooks use the Chrome operating system which is not a supported operating system for Blackboard. Some areas of Blackboard require Java on your computer, and Chromebooks do not support the use of Java. If you use a Chromebook, please be sure you also have access to a Mac computer or Windows computer so you can fully participate in your Blackboard class. Some things will not work on a Chromebook.

Please do not ONLY rely on a tablet, including an iPad, or a smartphone to use Blackboard. Not all features will work on tablets and smartphones. You may need access to a full computer to be able to do everything in your Blackboard class.

### Java

Make sure your computer is running the current version of java. It is a free download at [www.java.com](http://www.java.com).

### Internet Browser

Supported browsers for use with Blackboard include Firefox, Google Chrome, Internet Explorer, and Safari. If you experience any problems in Blackboard we recommend you login to the portal and Blackboard from another browser before seeking assistance from NTCC Technical support.

### Internet Access

While Bb can be accessed with dial-up online service, best results will be obtained when using a broadband Internet service.

## **Required Computer Literacy Skills:**

You will need to save documents and upload them to Blackboard. The NTCC Student Support link in your Blackboard class can direct you to help if needed for how to save and upload documents.

### Intermediate Internet Skills

You should be familiar with how the Internet works including following links and searching for information.

### Intermediate Word Processing Skills

You should be familiar with how to enter data (text) on a word processing document, format text, and save documents.

## **Course Structure and Overview:**

Lecture 1: Introduction to Molecular Diagnostics

Lecture 2: Specimen Types and Uses

Lecture 3: Nucleic Acid Isolation

Lecture 4: Polymerase Chain Reaction (PCR)

Lecture 5: Resolution and Detection of Nucleic Acids by Electrophoresis

Lecture 6: Analysis of Nucleic Acids by Southern Blotting

Lecture 7: Detection and Identification of Microorganisms

Lecture 8: Polymorphisms and Mutations

This is a Hybrid class which means lab meets once a week and all other instruction is done online via the learning management system BLACKBOARD. In-person meetings will be reserved for homework review, labs, and exams. Students are expected to complete all readings of the lecture materials, review PowerPoints, and complete the online activities. You will see that the course is divided into 5 weeks in the Blackboard portion. Each week you will be expected to complete certain online assignments for the chapters found in that week's folder. This course requires daily computer and internet access. You should expect to spend no less than 9 hours a week in this

course. Pay close attention to deadlines for all assignments. Technical difficulties are no excuse for late assignments. A due date assignment schedule is posted in the START HERE folder in Blackboard the entire semester! Please check it weekly so that you know what is due and do not miss anything.

Quizzes: Taken online, multiple-choice questions over topics covered in the lecture readings and PowerPoint. 8 quizzes averaged together for 20% of lecture grade; grades reflected immediately in Blackboard. First attempt is recorded for grade, but retake quizzes multiple times to study for exams.

Homework: MediaLab assignments. Students will be given a MediaLab username and password. They will complete the learning activity and assessment on MediaLab and submit their certificate of completion on Blackboard. There will also be an additional quiz posted in Blackboard to complete after submitting certificate. 4 assignments and 4 quizzes averaged together for 50% of lab grade.

Exams: Multiple choice questions from quizzes and homework taken on laptop; each is 20% of Lecture grade; grade reflected immediately in Blackboard.

Lab Worksheets/Participation: completed in-class. 4 labs averaged together for 50% of lab grade.

## Communications:

EMAIL: E-mail preferred. E-mails will be responded to within 24 hours during the work week (Monday – Thursday 8am-6pm and Friday 8-noon). Please check your NTCC email EVERYDAY. Email is the official form of communication used here at NTCC.

TEXT MESSAGE NOTIFICATIONS: You are required in this course to sign up for the text message notifications via Teams. I will use Teams to get information out to students quickly. This will enable you to receive important class announcements and reminders from me via text message so that you will not miss out on any assignment changes or important updates. You will be automatically added to the Teams group for this course. Please continue to check your NTCC email daily.

ANNOUNCEMENTS: These can be found on Blackboard under the course link on your Blackboard homepage. Please make sure you read any announcements thoroughly when they are posted there.

## Institutional/Course Policy:

### Classroom Expectations:

1. Attend all labs, be on time, and remain in class for the entire period.  
***If students are habitually late, the classroom door will be locked at the start of class.***  
If you must leave early, please inform the instructor before class begins.
2. Be prepared to take notes and participate in lab.
3. Be respectful of your classmates and instructors.
4. Turn off cell phones or set to vibrate.

**Attendance and Absences:** You are expected to attend ALL scheduled labs and take the exams as scheduled. You will be held responsible for all information covered in lab. *If you will be absent, inform the instructor by phone or email at least 15 minutes BEFORE class begins. Absences will be counted as unexcused if the instructor is not informed in a timely manner. This class only meets in person 5 times! More than ONE unexcused absence will result in the student being dropped from the course. Two unexcused late class attendance equals one unexcused absence.*

**Make-up Policy:** Late work will be accepted for quizzes and homework with a 10% late penalty. Assignments will be available on Blackboard each Tuesday and due by the following Tuesday at 9:30am. Late work will be accepted until Thursday at noon. After that date and time, a grade of zero will be entered for any work not completed. The

student is responsible for requesting a make-up when they are unable to attend a regularly scheduled examination. Make-up exams and labs will be scheduled only in the event of an EXCUSED absence. Due to the nature of the labs performed this semester, replication of the lab for makeup is not feasible. In the event a lab must be made up, an acceptable independent activity will be assigned. All make-up exams must be made up within one week following the absence during office hours or by appointment. If the test or lab is not made up, the student will receive a zero for that exam or lab.

### **Alternate Operations During Campus Closure and/or Alternate Course Delivery Requirements:**

In the event of an emergency or announced campus closure due to a natural disaster or pandemic, it may be necessary for Northeast Texas Community College to move to altered operations. During this time, Northeast Texas Community College may opt to continue delivery of instruction through methods that include, but are not limited to, online through the Blackboard Learning Management System, online conferencing, email messaging, and/or an alternate schedule. It is the responsibility of the student to monitor NTCC's website (<http://www.ntcc.edu/>) for instructions about continuing courses remotely, Blackboard for each class for course-specific communication, and NTCC email for important general information.

Additionally, there may be instances where a course may not be able to be continued in the same delivery format as it originates (face-to-face, fully online, live remote, or hybrid). Should this be the case, every effort will be made to continue instruction in an alternative delivery format. Students will be informed of any changes of this nature through email messaging and/or the Blackboard course site.

### **Statement Regarding the Use of Artificial Intelligence (AI) Technology:**

Employees and students shall be permitted to explore artificial intelligence (AI) and implement its use in and out of the classroom in accordance with policy and administrative regulations. The use of AI shall only be as a support tool to enhance student outcomes or as necessary to engage in research and shall never take the place of faculty, staff, and student decision-making. Any use of AI must comply with law, policy, and administrative regulations relating to student and employee privacy and data security. A student shall only use AI tools with faculty permission and shall be expected to produce original work and properly credit sources, including AI tools used in creating the work.

Example:

APA (7th edition)

OpenAI. (2026). ChatGPT (March 25 version) [Large language model]. <https://chat.openai.com/>

MLA (9th edition)

OpenAI. ChatGPT. 25 Mar. 2026, <https://chat.openai.com/>.

Employees or students who use AI tools to deceptively harm, bully, or harass others shall be disciplined in accordance with policy. [See DH, DIA series, FFD series, FFE, FLB, and the FM series] AI Use by Employees and Students. Northeast Texas Community College 225500 TECHNOLOGY RESOURCES CRB ARTIFICIAL INTELLIGENCE (LOCAL) DATE ISSUED: 12/8/2025 1 of 1 UPDATE 50 CRB(LOCAL)-AJC Adopted: 12/16/2025

### **NTCC Academic Honesty/Ethics Statement:**

NTCC upholds the highest standards of academic integrity. The college expects all students to engage in their academic pursuits in an honest manner that is beyond reproach using their intellect and resources designated as allowable by the course instructor. Students are responsible for addressing questions about allowable resources with the course instructor. Academic dishonesty such as cheating, plagiarism, and collusion is unacceptable and may result in disciplinary action. This course will follow the NTCC Academic Honesty and Academic Ethics policies stated in the Student Handbook. Refer to the student handbook for more information on these subjects.

### **ADA Statement:**

It is the policy of NTCC to provide reasonable accommodation for qualified individuals who are students with disabilities. This College will adhere to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodation as required to afford equal educational opportunity. It is the student's responsibility to request accommodation. An appointment can be made with the Academic Advisor/Coordinator of Special Populations located in Student Services and can be reached at 903-434-8264. For more information and to obtain a copy of the Request for Accommodations, please refer to the special populations page on the NTCC website.

### **Family Educational Rights and Privacy Act (FERPA):**

The Family Educational Rights and Privacy Act (FERPA) is a federal law that protects the privacy of student education records. The law applies to all schools that receive funds under an applicable program of the U.S. Department of Education. FERPA gives parents certain rights with respect to their children's educational records. These rights transfer to the student when he or she attends a school beyond the high school level. Students to whom the rights have transferred are considered "eligible students." In essence, a parent has no legal right to obtain information concerning the child's college records without the written consent of the student. In compliance with FERPA, information classified as "directory information" may be released to the general public without the written consent of the student unless the student makes a request in writing. Directory information is defined as: the student's name, permanent address and/or local address, telephone listing, dates of attendance, most recent previous education institution attended, other information including major, field of study, degrees, awards received, and participation in officially recognized activities/sports.

### **Tentative Course Schedule:**

A tentative course schedule will be posted as a separate document on Blackboard.