NORTHEAST TEXAS COMMUNITY COLLEGE
MLAB 2221 MOLECULAR DIAGNOSTICS
Summer I 2017

INSTRUCTOR INFORMATION
Richard Zylks, BS MT(ASCP)SC
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Office Hours
By appointment

COURSE INFORMATION

Lecture: Online
Laboratory: Wednesday 9:30-12:00 AM Meets in UHS 226

Course Description: The Molecular Diagnostics course will introduce the fundamentals of molecular diagnostic testing in the medical laboratory, including basic DNA and RNA structure, PCR, RT-PCR, Southern blotting, and electrophoresis. This course will cover the application of molecular diagnostic techniques in the identification and diagnosis of genetic diseases and diseases caused by microorganisms.

Course Goals and Objectives: The primary goal of this course is to provide students with an understanding of the basic principles and clinical significance of laboratory testing in the field of molecular diagnostics. Students are expected to learn the basic principles of DNA replication and how to perform basic molecular diagnostic techniques. Upon completion of this course, the student should be able to do the following:

- Describe the basic structure of DNA and RNA
- Describe the basic process of DNA replication
- Perform DNA extraction on a clinical specimen
- Demonstrate an understanding of basic molecular diagnostic techniques
- Demonstrate an understanding of electrophoresis in the separation of DNA fragments
- Apply molecular diagnostic techniques to the identification and diagnosis of diseases

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

Learning Resources:

Required Texts:	Buckingham, Lela: Molecular Diagnostics Fundamentals, Methods, and Clinical Applications; 2 ed.: F.A. Davis Company
Additional Resources:	Material on Blackbloard Laboratory experiments
Companion Website:	www.FADavis.com

Scan Competency	Molecular Diagnostics
Resources	Identify reagents, supplies and equipment needed for each laboratory procedure and organize laboratory procedures 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 and independent study to problem-solve results provided as case studies or unknowns during the laboratory.
Systems	Apply critical thinking skills to problems encountered in the laboratory and theoretical case studies.
Technology	Achieve competency in routine molecular diagnostics procedures.

Classroom Expectations:

1. Attend all classes and 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. Complete assigned readings before lecture over each topic.
3. Be prepared to take notes and participate in class.
4. You must EARN your grade; I do not GIVE grades.
5. Be respectful of your classmates and instructors.
6. Turn off cell phones/pagers or set to vibrate.

Grading: (Subject to change)

4 Medialab exams	*A*	*≥90%*
8 Homework assignments	*B*	*80-89%*
4 Laboratory experiments	*C*	*70-79%*
1 Comprehensive final exam	*D*	*60-69%*
	F	*<60%*

Final grade will be a combination of homework, exams, and participation in laboratory exercises. Homework and exams will account for 75% of the final grade and participation in laboratory exercises, 25%.

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.

Attendance and Absences: You are expected to attend ALL scheduled lectures and labs and take the exams as scheduled. You will be held responsible for all information covered in lecture. *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*. **Excessive unexcused absences will result in loss of points from your grade. More than two unexcused absences will result in a reduction of five (5) points being subtracted from your final grade (percentage). More than five unexcused absences will result in the student being dropped from the course. Two unexcused late class attendance equals one unexcused absence.**

Makeup Policy: Homework must be completed in its entirety by the due date assigned by the instructor. Late or partial homework will **NOT** be accepted unless there is a valid excuse (to be determined by the instructor). Media Lab modules and exams must be completed by the assigned due date. There will be no make-ups or extensions. If the exam is not completed by the assigned due date, the student will receive a zero for that exam. Makeup work for laboratory assignments will only be scheduled in the event of an **EXCUSED** absence as determined by the instructor.

COURSE OUTLINE
Unit 1: Fundamentals of genetics and DNA replication
Unit 2: Specimen types and uses
Unit 3: DNA and RNA extraction and isolation
Unit 4: Polymerase chain reaction (PCR)
Unit 5: Resolution and detection of nucleic acids by electrophoresis
Unit 6: Analysis of nucleic acids by Southern blotting
Unit 7: Detection and identification of microorganisms using molecular techniques
Unit 8: Polymorphisms and mutations

Media Lab Module 1: Fundamentals of Molecular Diagnostics
Media Lab Module 2: Real-Time PCR
Media Lab Module 3: HPV and Molecular Testing for Cervical Cancer
Media Lab Module 4: Molecular Methods in Clinical Microbiology

Students with Disabilities: It is the policy of Northeast Texas Community College to provide reasonable accommodations 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 accommodations as required to afford equal educational opportunity. It is the student's responsibility to arrange an appointment with a College counselor to obtain a Request for Accommodations form. For more information, please refer to the Northeast Texas Community College catalog or student handbook.

Academic Honesty: All students are expected to maintain high standards of integrity and honesty in all academic work. Northeast Texas Community College may initiate disciplinary proceedings against a student accused of scholastic dishonesty. Scholastic dishonesty includes, but is not limited to, statements, acts, or omissions related to applications for enrollment or the award of a degree, and/or the submission as one's own work material that is not one's own. Scholastic dishonesty may involve, but is not limited to, one or more of the following acts: cheating, plagiarism, collusion, use of annotated texts or teacher's editions, and/or falsifying academic records.

- **Plagiarism** is defined as the appropriation of any person's work and the unacknowledged incorporation of that work in one's own work offered for credit.
- **Cheating** is defined to include the following: copying from another students paper; using materials during a test not authorized by the person giving the test; collaborating with any other person during the test without permission; knowingly obtaining, using, buying, selling, transporting, or soliciting in whole or in part the content of test not yet administered; substituting for another student or permitting any other person to substitute for oneself; copying computer or Internet files, using someone else's work for assignments as if it were one's own, or any other dishonest means of attempting to fulfill the requirements of a course.
- **Collusion** is defined as the unauthorized collaboration with any person in preparing work offered for credit.

Students are expected to uphold the school's standard of conduct relating to academic honesty. Students assume full responsibility for the content and integrity of the academic work they submit. The guiding principle of academic integrity shall be that a student's submitted work, examinations, reports, and projects must be that of the student's own work. Students shall be guilty of violating the honor code if they:

1. Represent the work of others as their own.
2. Use or obtain unauthorized assistance in any academic work.
3. Give unauthorized assistance to other students.
4. Modify, without instructor approval, an examination, paper, record, or report for the purpose of obtaining additional credit.
5. Misrepresent the content of submitted work.

Any student violating the honor code is subject to receive a failing grade for the course and will be reported to the Office of Student Affairs. If a student is unclear about whether a particular situation may constitute an honor code violation, the student should meet with the instructor to discuss the situation.

Tentative Exam Schedule:

Exam	Unit/Topics Covered	Date
Media Lab Exam 1	Fundamentals of Molecular Diagnostics	Due by 6/11
Media Lab Exam 2	Real Time PCR	Due by 6/18
Media Lab Exam 3	HPV and Molecular Testing for Cervical Cancer	Due by 6/25
Media Lab Exam 4	Molecular Methods in Clinical Microbiology	Due by 7/2
Comprehensive Final	Lecture Units 1 - 8	7/5

Tentative Laboratory Schedule:

Date	Laboratory Topic/Assignment
Monday, June 5	Lab Orientation; Molecular Diagnostics Virtual Lab
Wednesday, June 14	DNA Extraction
Wednesday, June 21	DNA Separation by Electrophoresis
Wednesday, June 28	DNA Replication by PCR

Student Contract for MLAB 2221

I, _____, have received, read and understand the syllabus for MLAB 2221 Molecular Diagnostics, offered at Northeast Texas Community College.

_____
Student's signature

_____
Date

Current Contact Information:

Phone:_____

Cell phone:_____

Preferred email address:_____