

MLAB 2378 Fundamentals of Molecular Diagnostics

Course Syllabus

Fall 2009

Instructor: Terry Kotrla, MS, MT(ASCP)BB

Office: Eastview Campus, Building 9000, Room 9336
Cypress Creek Campus, Adjunct Faculty Office

Phone: 223-5932

Email: kotrla@austincc.edu

Phone: Cell - 560-5361

Office Hours: First 8 Weeks

Monday and Wednesday 1-3pm at Cypress Creek Campus Adjunct Office

Tuesday 7-8am Eastview Campus, room 9336

Second 8 Weeks

Monday and Tuesday 7-8am Eastview Campus, room 9336

Wednesday 10a - 1pm

Appointments are encouraged.

Length of Lecture: 16 Weeks, August 24- December 13

Total Number of Hours: 48

Course Description

This course provides a comprehensive overview of the fundamental principles of clinical molecular diagnostics and explores the use of molecular techniques in the diagnosis of disease. Topics to be covered include: nucleic acid structure and function, genetics, DNA chemistry, introduction to nucleic acid isolation, identification and amplification techniques used in infectious disease diagnosis in the clinical laboratory, components of a molecular laboratory, and evaluation of controls to validate results obtained.

Prerequisites: Graduation from an accredited MLT/CLT or MT/CLS program or Department Chair approval. Submission of a completed application for the Molecular Diagnostics certificate program and successful completion of a Criminal Background Check.

SCANS Competencies

Recently the U.S. Department of Labor established the Secretary's Commission on Achieving Necessary Skills (SCANS) to examine the demands of the workplace and whether the nation's students are capable of meeting those demands. The Commission determined that today's jobs generally require competencies in the following areas.

- a. Resources: Identifies, organizes, plans, and allocates resources
- b. Interpersonal: Works with others
- c. Information: Acquires and uses information
- d. Systems: Understands complex interrelationships
- e. Technology: Works with a variety of technologies

The Texas Higher Education Coordinating Board is now requiring all degree plans in institutions of higher education incorporate these competencies and identify to the student how these competencies are achieved in course objectives.

Examples of SCANS competencies being incorporated are as follows:

COMPETENCY	EXAMPLE
Resources	Determines amounts of materials needed for designated procedures to preserve expensive resources.
Interpersonal	Expresses opinions and interacts with others in a tactful, professional manner.
Information	Acquires, evaluates, organizes and interprets information as it relates to Molecular Diagnostics.
Systems	Knows how technological systems works and is able to diagnose deviations in procedures and predict how to correct malfunctions.
Technology	Chooses procedures, tools or equipment including computers and related technologies.

Course Goals

1. Apply knowledge of cellular structure and function, especially DNA and RNA, to molecular diagnostic procedures.
2. Gain a thorough working knowledge of nucleic acid extraction, resolution and detection.
3. Gain a solid foundation in the most commonly utilized molecular diagnostic testing protocols.
4. Apply the knowledge of molecular testing to the most commonly performed applications in the clinical laboratory such as: nucleic acid extraction, resolution and detection, analysis and characterization of nucleic acids and proteins, nucleic acid amplification and DNA sequencing.

Course Objectives

1. Describe cell function and structure.
2. State the basic principles of modern genetics as they apply to disease transmission.
3. State the structure, function and duplication of DNA and RNA.
4. Describe methods for nucleic acid extraction and detection.
5. List and describe the methods for analysis and characterization of nucleic acids and proteins.
6. Describe chromosomal structure and mutations and methods to detect.
7. Briefly describe techniques used in the clinical lab to detect: DNA Polymorphisms, microorganisms, inherited diseases, neoplastic diseases and DNA-based tissue typing.
8. State the required quality assurance and quality control measures required in a molecular laboratory.

Instructional Methodology

1. Textbook reading assignments
2. Powerpoint presentations
3. Internet Web Sites - <http://www.austincc.edu/kotrla/md>
4. BlackBoard (<http://acconline.austincc.edu>)

This course will be conducted via the computer through the Blackboard online learning system. All students will be required to have an email address and are expected to use the computer to access course materials, learning activities, and exams on-line. Students who do not have access to home computers should be prepared to access all materials and take exams at a public computer which are readily available in the Austin area; including those in the Learning Labs and libraries at all ACC campuses. Visit <http://www.austincc.edu/tutor/students/computers.php> for locations and hours of operation. Before taking any on-line exams, students should verify that the computer they are using (and its internet access) will be available to them for the duration of the test

Materials Required

1. Textbook: Molecular Diagnostics: Fundamentals, Methods and Clinical Applications. Authors: Lela Buckingham and Maribeth Flaws.
ISBN-10: 0803616597
ISBN-13: 978-0803616592
2. Two inch binder with dividers.

Student Evaluation

1. Points will be awarded as follows:
 - a. BlackBoard assignments 100 points
 - b. Review quizzes for major exams 100 points
 - c. Assignments 200 points
 - d. Four (4) major exams 400 points
 - e. Final exam to be taken at ACC testing center 200 points

2. Grading System

A	=	90 -100%
B	=	80 - 89%
C	=	70 - 79%
D	=	60 - 74%
F	=	59% or below
I	=	Incomplete: A student must have a passing average (75% or better) and have completed at least 80% of the course work. The MLT student will be permitted to register for MAB 2360 with the understanding that the incomplete will be completed within the same semester. No credit will be given for MLAB 2360 unless MLAB 2360 is completed.
W	=	Withdrawal: .

3. Please meet with the MLT Department Chair before making any decision on withdrawal. We will assist you in any way possible with problem areas

Course Requirements and Regulations

1. **BlackBoard assignments and written assignments**

These are due by the dates on the schedule. Late assignments will be given 80% credit.
2. **Review Quizzes**

Review quizzes MUST be taken before taking the exam and a score of 80% or better is required prior to taking the exam.
3. **Exams**

Exams are given through BlackBoard. The highest level of honesty is expected of each student. If a student misses one exam, the grade of the final exam will be averaged in the place of the missed exam grade. If any other exams are missed, grades of "0" will be given. Academic honesty is imperative. Exam grades will be compared to the final exam grade. The exam grade average must be comparable to the final exam grade.
4. **Academic Dishonesty**

Acts prohibited by the college for which discipline may be administered include scholastic dishonesty, including but not limited to cheating on an exam or quiz, plagiarizing, and unauthorized collaboration with another in preparing outside work. Academic work submitted by students shall be the result of their thought, research or self-expression. Academic work is defined as, but not limited to, tests, quizzes, whether taken electronically or on paper, projects, either individual or group; classroom presentations, and homework. Please refer to the current Austin Community College Student Handbook.

5. **Class Participation**

Each student is strongly encouraged to participate in class through the discussion board. In any classroom situation that includes discussion and critical thinking, there are bound to be many differing viewpoints. These differences enhance the learning experience and create an atmosphere where students and instructors alike will be encouraged to think and learn. On sensitive and volatile topics, students may sometimes disagree not only with each other but also with the instructor. It is expected that faculty and students will respect the views of others when expressed in classroom discussions

6. **Students with Disabilities**

Each ACC campus offers support services for students with documented physical or psychological disabilities. Students with disabilities must request reasonable accommodations through the Office for Students with Disabilities on the campus where they expect to take the majority of their classes. Students are encouraged to do this three weeks before the start of the semester. Please refer to the current Austin Community College Student Handbook or <http://www.austincc.edu/support/osd/> .

Promotion, Failure, and/or Dismissal from the Program

A minimum grade of “C” (70%) is required in of all Molecular Diagnostics course work.

Any student may be dropped from the program due to excessive absences and/or consistently failing to meet class assignments, for disruptive conduct during lecture or lab or for displaying conduct detrimental to the ethics of medical laboratory technology.

The student may utilize the approved Student Grievance Procedure of Austin Community College as detailed in the ACC Student Handbook (<http://www.austincc.edu/handbook/>) in the disposition of a grievance or complaint without fear of recrimination or retaliation as a result of filing a grievance.

The MLT faculty and staff understand that learning in group situations can be beneficial. However, each student is expected to demonstrate his/her own competency by doing his/her own work. Any student caught cheating on examinations, on unknowns, or sharing lab results will be subject to disciplinary action, including an academic penalty and possible withdrawal from the program.

MLAB 2378 Fundamentals of Molecular Diagnostics Statement of Understanding

I have read the Syllabus, have had my questions answered and indicate my understanding by initialing each item listed below:

- _____ Course Goals
- _____ Course Objectives
- _____ Evaluation and Grading Criteria
- _____ Course Requirements and Regulations

I agree to abide by all of the policies, procedures, and requirements stated within.

Printed Name _____

Signature _____ Date _____

Copy/paste the information on this page into an email and send to your instructor.