COURSE WEB SITE: http://www.austincc.edu/mlt/mdfund/mdfund
Course Outline and Schedule: http://www.austincc.edu/mlt/mdfund/mdfund_schedule

This schedule is tentative. Do NOT print the schedule until instructed by the professor. The schedule is subject to change. Any changes will be communicated by the professor.

<table>
<thead>
<tr>
<th>Course Number and Name</th>
<th>Campus</th>
<th>Section</th>
<th>Synonym</th>
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<tbody>
<tr>
<td>MLAB 2321 Molecular Diagnostics for CLS</td>
<td>DL</td>
<td>001</td>
<td>26088</td>
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FACULTY INFORMATION

<table>
<thead>
<tr>
<th>Campus</th>
<th>Round Rock Campus</th>
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<tbody>
<tr>
<td>Instructor</td>
<td>Terry Kotrla, MS, MT(ASCP)BB</td>
</tr>
<tr>
<td>Office</td>
<td>Cypress Creek Campus, Bldg. 1000, Room 1104</td>
</tr>
<tr>
<td>Office Hours</td>
<td>By appointment. Can be in person or by phone.</td>
</tr>
<tr>
<td>Phone</td>
<td>Cell 512-560-5361</td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:kotrla@austincc.edu">kotrla@austincc.edu</a></td>
</tr>
</tbody>
</table>

COURSE INFORMATION

Dates: January 20 – May 17, 2015

This course is offered online.

Students will access and print out course materials from the course web site. 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.

USE OF ACC EMAIL

All College e-mail communication to students will be sent solely to the student’s ACCmail account, with the expectation that such communications will be read in a timely fashion. ACC will send important information and will notify you of any college related emergencies using this account. Students should only expect to receive email communication from their instructor using this account. Likewise, students should use their ACCmail account when communicating with instructors and staff. Information about ACCmail, including instructions on setting up an account, can be found at http://www.austincc.edu/accmail/.

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 are required to complete the certificate program.
COURSE GOALS/RATIONALE
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
Upon successful completion of this course, the student should be able to:
1. List and describe the structure of a cell and the function of the structures contained within.
2. Demonstrate an understanding of human genetics by identifying the trait transmission of genetic abnormalities and creating a family pedigree illustrating the transmission of a specific trait.
3. Describe the structure, function and replication of DNA and RNA.
4. Describe the structure and function of protein synthesis.
5. List and describe the methods steps for nucleic acid extraction, determination of quantity and quality.
6. Describe the procedures used for the resolution and detection of nucleic acids.
7. Describe the methods utilized for the analysis and characterization of nucleic acids and proteins.
8. Describe the purpose of each reagent and steps required for the polymerase chain reaction.
9. Compare and contrast the different nucleic acid amplification procedures.
10. Describe human chromosomal structure and identify normal versus mutations which may be present.
11. Describe the methods used to detect genetic mutations in humans.
12. Describe the methods used for sequencing DNA.
13. Describe and state the methods used for detecting and identifying human polymorphisms.
14. Compare traditional and molecular basis of detection and identification of pathogenic microorganisms.
15. Describe the most commonly inherited genetic diseases and the methods used for detection.
16. List examples of conditions for which molecular oncology testing is used to diagnose.
17. List and describe the testing performed for DNA based tissue typing.
18. List and describe the procedures utilized for quality control and quality assurance in the molecular diagnostic laboratory.

COURSE MATERIALS
2. Two inch binder with dividers.

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:

<table>
<thead>
<tr>
<th>COMPETENCY</th>
<th>EXAMPLE</th>
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<tbody>
<tr>
<td>Resources</td>
<td>Determines amounts of materials needed for designated procedures to preserve expensive resources.</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>Expresses opinions and interacts with others in a tactful, professional manner.</td>
</tr>
<tr>
<td>Information</td>
<td>Acquires, evaluates, organizes and interprets information as it relates to Molecular Diagnostics.</td>
</tr>
<tr>
<td>Systems</td>
<td>Demonstrate the ability to work with technological systems and is able to diagnose deviations in procedures and predict how to correct malfunctions.</td>
</tr>
<tr>
<td>Technology</td>
<td>Chooses procedures, tools or equipment including computers and related technologies.</td>
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**PROGRAM STUDENT LEARNING OUTCOMES**

Upon completion of the Molecular Diagnostics Enhanced Certificate, the student will:
1. Apply knowledge of cellular structure and function, especially DNA and RNA, to molecular diagnostic procedures.
2. Demonstrate a thorough working knowledge of nucleic acid extraction, resolution and detection.
3. Perform the most frequently 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.
5. Develop proficiency in the clinical competencies of the rotation by applying basic principles and procedures, demonstrating organizational skills and accurate performance of technical skills.

**INSTRUCTIONAL METHODOLOGY**

1. Textbook reading assignments
2. PowerPoint presentations
3. Internet Web Sites - [http://www.austincc.edu/mlt/mdfund/mdfund_links](http://www.austincc.edu/mlt/mdfund/mdfund_links)
4. BlackBoard ([http://acconline.austincc.edu](http://acconline.austincc.edu))

This course will be conducted via the computer through the Blackboard online learning system. All students are expected to use a computer to access course materials, learning activities, and exams online. 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](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.

Students are expected to communicate with instructor as needed by phone, email or text messages to cell phone. During the week the instructor will respond within 24 hours, response to weekend inquiries will vary. **Please, no phone calls after 8:00pm.**
BLACKBOARD ON-LINE SYSTEM
A considerable portion of this course will be conducted via the computer on-line Blackboard learning system. All students will be required to have an email address and to access course materials, learning activities, and exams on-line. Students may use their home computers OR may access all materials and take exams at any public computer, including those in Learning Labs and libraries at all ACC campuses.

How to Log Into Blackboard
1. To access Blackboard, go to http://acconline.austincc.edu/
2. Enter your ACCeID and ACCeID Password in the provided boxes, and then click on the “Login” button.
3. Access your course(s) by clicking the course title located in the My Courses module.
4. ACC Blackboard support website is http://irt.austincc.edu/blackboard/.

ATTENDANCE POLICY
This is an online course so physical attendance is not required. In the “virtual world” of this course your attendance will be monitored by documenting timely submission of required assignments and taking exams by the stated due date. Students who fall more than two weeks behind or miss two consecutive exams will be dropped from the course.

COURSE POLICIES

Check your ACC Gmail account OFTEN.
Important announcements will be sent through BlackBoard email which is sent directly to the student’s ACC Gmail account. The instructor will not be sending course announcements to personal email accounts as these cannot be configured into BlackBoard.

BlackBoard assignments and written assignments
These are due by the dates on the schedule. All written assignments are to be uploaded into “Assignments” through BlackBoard. Late assignments will be given 80% credit if submitted within one week. A grade of “0” will be awarded for assignments more than 1 week late.

Review Quizzes
Review quizzes MUST be taken before taking the exam and a score of 80% or better is required to access the exam. The quizzes may be taken multiple times to achieve the required score.

Exams
All exams are given through BlackBoard. You will be allowed 1 opportunity to take the exam. Exams are to be taken on a computer with reliable internet access or at an ACC computer lab with the exception of the course Final. The final exam will be taken at an ACC testing center or proctored by an individual approved by the professor.

You must take the Exam Review Quiz PRIOR to taking the exam if one is available. 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. Under no circumstances are you to print out the exams.

Class Participation
Each student is required 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.
STUDENT EVALUATION AND GRADING

1. Points will be awarded as follows:
   a. BlackBoard assignments 100 points
   b. Syllabus quiz and review quizzes for major exams 100 points
   c. Submitted graded 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 = 900 -1000 Points
   B = 800 - 890 Points
   C = 700 - 790 Points
   D = 600 - 740 Points
   F = 590 Points or below

Incomplete: An instructor may award a grade of “I” (Incomplete) if a student was unable to complete all of the objectives for the passing grade in a course. An incomplete grade cannot be carried beyond the established date in the following semester. The completion date is determined by the instructor but may not be later than the final deadline for withdrawal in the subsequent semester.

A student must have a passing average (750 points or higher) and have completed at least 80% of the course work. The student will be permitted to register for MAB 2337 with the understanding that the incomplete will be completed within the same semester. No credit will be given for MLAB 2337 unless MLAB 2321 is completed.

WITHDRAWAL POLICY
It is the responsibility of each student to ensure that his or her name is removed from the roll should he or she decides to withdraw from the class. The instructor does, however, reserve the right to drop a student should he or she feel it is necessary. If a student decides to withdraw, he or she should also verify that the withdrawal is submitted before the Final Withdrawal Date. The student is also strongly encouraged to retain their copy of the withdrawal form for their records.

Students who enroll for the third or subsequent time in a course taken since Fall, 2002, may be charged a higher tuition rate, for that course.

State law permits students to withdraw from no more than six courses during their entire undergraduate career at Texas public colleges or universities. With certain exceptions, all course withdrawals automatically count towards this limit. Details regarding this policy can be found in the ACC college catalog.

SCHOLASTIC DISHONESTY
A student attending ACC assumes responsibility for conduct compatible with the mission of the college as an educational institution. Students have the responsibility to submit coursework that is the result of their own thought, research, or self-expression. Students must follow all instructions given by faculty or designated college representatives when taking examinations, placement assessments, tests, quizzes, and evaluations. Actions constituting scholastic dishonesty include, but are not limited to, plagiarism, cheating, fabrication, collusion, and falsifying documents. Penalties for scholastic dishonesty will depend upon the nature of the violation and may range from lowering a grade on one assignment to an “F” in the course and/or expulsion from the college. See the Student Standards of Conduct and Disciplinary Process and other policies at http://www.austincc.edu/current/needtoknow
Academic dishonesty such as, but not limited to, the following may result in IMMEDIATE dismissal from the withdrawal from the course. If the withdrawal date has passed the student will be given a “D” for each course.

1. Submitting homework assignments copied from others. Both the student and the student that the materials were copied from will receive a "0" for the assignment and may be subject to the Academic Dishonesty Process and dismissal from the program.
2. Using study materials, unless specifically allowed to do so, on exams.
3. Printing out examinations.

STUDENT RIGHTS AND RESPONSIBILITIES
Students at the college have the rights accorded by the U.S. Constitution to freedom of speech, peaceful assembly, petition, and association. These rights carry with them the responsibility to accord the same rights to others in the college community and not to interfere with or disrupt the educational process. Opportunity for students to examine and question pertinent data and assumptions of a given discipline, guided by the evidence of scholarly research, is appropriate in a learning environment. This concept is accompanied by an equally demanding concept of responsibility on the part of the student. As willing partners in learning, students must comply with college rules and procedures.

Each student is strongly encouraged to participate in class. 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.

SAFETY STATEMENT
Austin Community College is committed to providing a safe and healthy environment for study and work. You are expected to learn and comply with ACC environmental, health and safety procedures and agree to follow ACC safety policies. Additional information on these can be found at [http://www.austincc.edu/ehs](http://www.austincc.edu/ehs).

Because some health and safety circumstances are beyond our control, we ask that you become familiar with the Emergency Procedures poster and Campus Safety Plan map in each classroom. Additional information about emergency procedures and how to sign up for ACC Emergency Alerts to be notified in the event of a serious emergency can be found at [http://www.austincc.edu/emergency/](http://www.austincc.edu/emergency/).

Please note, you are expected to conduct yourself professionally with respect and courtesy to all. Anyone who thoughtlessly or intentionally jeopardizes the health or safety of another individual will be dismissed from the day’s activity, may be withdrawn from the class, and/or barred from attending future activities.

STUDENT AND INSTRUCTIONAL SERVICES
ACC strives to provide exemplary support to its students and offers a broad variety of opportunities and services. Information on these services and support systems is available at: [http://www.austincc.edu/support/](http://www.austincc.edu/support/)

Links to many student services and other information can be found at: [http://www.austincc.edu/](http://www.austincc.edu/).
ACC Learning Labs provide free tutoring services to all ACC students currently enrolled in the course to be tutored. The tutor schedule for each Learning Lab may be found at: [http://www.austincc.edu/tutor](http://www.austincc.edu/tutor) For help setting up your ACCeID, ACC Gmail, or ACC Blackboard, see a Learning Lab Technician at any ACC Learning Lab.
PROMOTION, FAILURE OR DISMISSAL FROM THE PROGRAM

1. MLAB 2321 is the first of three courses in the Molecular Diagnostics certificate program. A minimum grade of “C” (70%) is required in all Molecular Diagnostics course work to continue to the next course.

2. Any student may be dropped from the course due to consistently failing to meet class assignments.

3. The student may utilize the student “Complaints and Grade Disputes” process in the disposition of a complaint without fear of recrimination or retaliation. This is at the ACC “Need to Know” web site http://www.austintc.edu/current/needtoknow/.

4. Faculty 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 or submitting work that is not their own will be subject to disciplinary action, including an academic penalty and possible withdrawal from the course.

5. Students must submit an application to the Molecular Diagnostics certificate program by the end of the MLAB 2321 course which must include submission of the completed immunization form located at http://www.austintc.edu/health/immunizations.php to continue on in the program.

6. Students will be notified when to submit the Criminal Background Check (CBC) and drug screen. A clear CBC and drug screen is required to complete the certificate program.

STUDENTS WITH DISABILITIES

Each ACC campus offers support services for students with documented disabilities. Students with disabilities who need classroom, academic or other accommodations must request them through the office Student Accessibility Services (SAS). Students are encouraged to request accommodations when they register for courses or at least three weeks before the start of the semester, otherwise the provision of accommodations may be delayed.

Students who have received approval for accommodations for this course must provide the instructor with the ‘Notice of Approved Accommodations’ at the beginning of the semester to allow for a reasonable amount of time to prepare and arrange for the accommodations. Arrangements for academic accommodations can only be made after the instructor receives the ‘Notice of Approved Accommodations’ from the student.

Additional information about Student Accessibility Services is available at http://www.austintc.edu/current/needtoknow/.

STATEMENT OF UNDERSTANDING

Please email your instructor with any questions about the course Syllabus. After carefully reviewing the course Syllabus complete the Statement of Understanding quiz in BlackBoard located in the “Exams” section. You MUST make 100% on the quiz. The quiz may be taken multiple times to achieve the required 100% score.