Clinical Laboratory Methods CLSC 5227-01 Spring 2019

Lecture Instructor:

**Name:** Sandra L. Tijerina, MS, MLS (ASCP) cm, SBB, SH(ASCP) cm  
**Term:** Spring 2018  
**Telephone #:** (956) 665-2296  
**UTRGV email address:** sandra.tijerina@utrgv.edu  
**Meeting times and location:** Lecture-Mondays: 3:05-4:20pm HAB – E 1.102  
Lab-Fridays: 1:00-5:00pm HSHW 2.106, 2.104

**Office location and hours:** EHAB-West 2.206A  
Monday 1:00 to 2:30 PM Tuesday 9:00-10:00 AM  
Wednesday 9:00 to 10:00 AM

Do not hesitate to send me an email if we need to talk so we can agree on a convenient time for a phone call, or a meeting.

Laboratory Instructors:

Sandra L. Tijerina, MS., MLS(ASCP) cm, SBB, SH(ASCP) cm  
**Office:** EHAB-W – 2.206  
**Office Telephone:** (956) 665-5269  
**Email:** sandra.tijerina@utrgv.edu  
**Office Hours:** TBA

Daniella Gill, MSHS., MLS (ASCP) cm  
**Office:** EHAB-W 2.310  
**Office Telephone:** (956) 665-2289  
**Email:** daniella.gill01@utrgv.edu  
**Office Hours:** TBA
PREREQUISITE: Admission into the Physician Assistant Studies Program

REDIT HOURS: 2 CONTACT HOURS: 1 hour of lecture per week and 3 hours of lab per week COURSE DESCRIPTION: This is a lecture and laboratory course that introduces the student to the medical laboratory. Emphasizes appropriate laboratory studies for specific diseases, normal laboratory values and procedures for obtaining samples. Students are given the opportunity to perform routine lab studies

TEXTBOOK AND REQUIRED MATERIALS:
- Wallach’s Interpretation of Diagnostic Tests by Williamson and Snyder, Lippincott Williams & Wilkins; Tenth Edition (2014).
- For lab: Full length WHITE disposable labcoat (no other color is acceptable)

METHODS OF EVALUATION: The final grade for this course will be the sum of all grades obtained in the following sections:

Lecture (70%)
Three exams ................................................................. 45%
Online Quizzes............................................................... 5%
Final comprehensive exam............................................. 20%

Laboratory (30%)
Quizzes .................................................................2%
MTS tutorials...............................................................3%
Case Studies............................................................10%
Phlebotomy Skills, .........................................................5%
UA test, pregnancy, glucometer, hgb & hct tests, gram stain, KOH…10%

A = 90 - 100%; B = 80 - 89%; C = 70 - 79 %; <70 F

STUDENT RESPONSIBILITY:
1. Students will be expected to attend class, take notes and participate in class discussions and laboratory activities.
2. Laboratory and small group activities will be completed in class. There will be no make-up for these projects without prior approval of the instructor.
3. Assignments are expected to be turned in at the beginning of the class period on the due date. Late
assignments will have 5 points deducted per day from the final grade. All written case study assignments for lab must be typed.

4. Make-up tests will be given only if prior approval has been received from the instructor.

5. Students are expected to help maintain a classroom environment that is conducive to learning. To ensure that all students have the opportunity to gain from time spent in class, students are prohibited from engaging in any form of disruptive behavior. Examples of disruptive behavior include: use of cellular phones or beepers during class, arriving late or leaving class early, missing deadlines, prolonged chattering, reading other materials during class, offensive remarks to fellow students or faculty. Inappropriate behavior in the classroom may result, minimally in a request to leave the class. Patterns of repeated behavior or more severe infractions may be referred to the Dean of Students.

6. The lecture exams are primarily multiple choice and are generally 50 questions in length. The lecture final is approximately 100 questions in length. Students will have 50 minutes to complete each of the major unit exams and 2 hours to complete the final. No books, notebooks, cell phones, electronic devices, purses or other personal items are allowed on the desk. All personal items should be placed at the back of the room. Cell phones should be turned off prior to the start of the exam. Students who leave the room once the exam has been distributed will not be allowed to come back in. Students should take care of all bathroom and snack needs before arriving. Use of cell phones, PDA’s, programmable calculators or other electronic devices is prohibited during exams. All lecture exams are delivered through the SofTest-M app on Apple iPad. Remediation and retesting is not offered for lecture examinations.

**ATTENDANCE:**
Students are expected to attend all scheduled classes and may be dropped from the course for excessive absences. Attendance is expected in both lecture and laboratory sessions. In the event of an unavoidable absence, the student must notify the instructor. Due to the structure of the course, laboratory make-ups will not be possible. If a student misses a class, it is their responsibility to get handouts and notes from a fellow classmate. UTRGV’s attendance policy excuses students from attending class if they are participating in officially sponsored university activities, such as athletics; for observance of religious holy days; or for military service. Students should contact the instructor in advance of the excused absence and arrange to make up missed work or examinations.

**SAFETY:**
Students must wear laboratory coats and gloves during laboratory sessions. No food or drink will be allowed in the laboratory. All materials must be disposed of properly and tables disinfected before leaving the laboratory. All reusable supplies must be placed on the carts and papers turned in before leaving the laboratory. Students will be required to purchase disposable full length white laboratory coats which may not be removed from the laboratory. These coats should be labeled with the student’s name. Safety measures described in lab must be adhered to in order to participate in lab activities.

**ADDITIONAL REFERENCES:**
Desai, Samir Clinician’s Pocket Guide to Laboratory Medicine, Lexi-Comp2009
Michael Laposata, Laboratory Medicine: The Diagnosis of Disease in the Clinical Laboratory; McGraw-Hill Medical 1st Edition, May 2010

**APPS:**
Clinlab Navigator To Go
LabDx
Medical Lab Tests by Medicon Apps

**Websites:**
http://www.arupconsult.com
http://www.neosoft.com/~uthmman/lab_test.html
http://www.utrgv.edu : Academics-Library (MTS Training library in Database section)

**Calendar of Activities**
January 14 First day of classes
January 17 Last day to add a course or register for spring 2018
March 11 – 16 SPRING BREAK – NO classes
March 30 – 31 EASTER HOLIDAY – NO classes
April 10 Last day to drop a course; will count toward the 6-drop rule
May 1 Last day of classes
May 2 Study Day – NO class
May 3 – 9 Spring 2018 Final Exams
May 10 - 11 Commencement Ceremonies

**STUDENTS WITH DISABILITIES:**
If you have a documented disability (physical, psychological, learning, or other disability which affects your academic performance) and would like to receive academic accommodations, please inform your instructor and contact Student Accessibility Services to schedule an appointment to initiate services. It is recommended that you schedule an appointment with Student Accessibility Services before classes start. However, accommodations can be provided at any time. **Brownsville Campus:** Student Accessibility Services is located in Cortez Hall Room 129 and can be contacted by phone at (956) 882-7374 (Voice) or via email at accessibility@utrgv.edu. **Edinburg Campus:** Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at accessibility@utrgv.edu.

**MANDATORY COURSE EVALUATION PERIOD:**
Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (http://my.utrgv.edu); you will be contacted through email with further instructions. Students who complete their evaluations will have priority access to their grades. Online evaluations will be available:
Spring 2019 Module 1 February 13 – February 19
Spring 2019 Module 2 April 10 – April 16
Spring 2019 (full semester) April 10 – May 1

**SCHOLASTIC INTEGRITY:**
As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating, plagiarism, and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents Rules and Regulations and UTRGV Academic Integrity Guidelines). All scholastic dishonesty incidents will be reported to the Dean of Students.

**SEXUAL HARASSMENT, DISCRIMINATION, and VIOLENCE:**
In accordance with UT System regulations, your instructor is a “responsible employee” for reporting purposes under Title IX regulations and so must report any instance, occurring during a student's time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect in an environment free from sexual misconduct and discrimination.

**COURSE DROPS:**
According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the “3-peat rule” and the “6-drop” rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped
at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.

University policy requires all electronic communication between the University and students be conducted through the official University supplied systems; namely UTRGV Mail for email or Blackboard for course specific correspondence. Therefore, please use your UTRGV assigned Mail or Blackboard account for all future correspondence with UTRGV faculty and staff.

Overall Program Student Learning Outcomes: Upon Completion of the Program, the graduate will:

1. Demonstrate the acquisition of knowledge in the basic medical sciences appropriate for the entry level physician assistant.
2. Demonstrate effective aptitude in the medical management of common primary care diseases expected of the entry level physician assistant.
3. Demonstrate the acquisition of advanced clinical skills appropriate for the entry level physician assistant.

Overall Course Outcome:
Students will be able to select appropriate laboratory tests, perform phlebotomy and waived tests such as the fingerstick glucose, and interpret the results in relation to common disease patterns.

Specific Course Objectives:
Upon successful completion of the lecture and laboratory portion of this course, the student should be able to:

Safety
Cognitive
1. Describe appropriate safety procedures for use when exposure to blood borne pathogens may occur.
2. Discuss the concept of Universal or Standard precautions.
3. Identify appropriate personal protective equipment.
4. Describe the appropriate procedure for disposing of items which might be contaminated with blood or body fluids.
6. Identify information contained on warning labels and MSDS sheets.
7. Identify the risk of disease transmission when an exposure to blood or body fluids occurs.

Affective
1. Demonstrate the importance of appropriate safety procedures by complying with all laboratory safety rules.
2. Maintain the work area in an orderly and clean manner by returning all materials to their appropriate area after use.
3. Protect other students and faculty from accidental injury by disposing of all equipment inappropriate containers.
4. Advocate the use of personal protective equipment when handling blood or body fluids.
5. Demonstrate an acceptance of responsibility for his/her own learning by consistently preparing for lecture and laboratory sessions.
6. Accept constructive criticism as part of the learning process and act upon suggestions for improvement.
7. Demonstrate integrity by striving to perform to the best of his/her own ability, admitting mistakes and taking appropriate corrective action.
8. Demonstrate dependability by attending all lecture and laboratory sessions and arriving promptly at the designated time.
10. Show initiative by asking questions and seeking other sources of information.
11. Exhibit a respectful, courteous and friendly attitude when working with fellow students and instructors.
12. Use equipment and supplies in a careful, responsible manner.
13. Show an appreciation for teamwork by working cooperatively and constructively in groups when directed by the instructor.
14. Listen attentively during class activities.
15. Exhibit an acceptable level of self confidence in his/her ability to perform laboratory testing.
16. Use time wisely, organizing and completing assignments in a timely fashion and following through when problems arise.
17. Demonstrate adaptability by being flexible to changes that may occur in both the lecture and laboratory settings.

Psychomotor
1. Utilize appropriate personal protective equipment in the laboratory.
2. Dispose of all contaminated equipment in the appropriate receptacles.
3. Demonstrate appropriate handwashing procedures.

Introduction to the Laboratory

Cognitive
1. Explain how "Normal or Reference" values are determined.
2. Identify the limitations and problems associated with common methods of determining reference values.
3. Describe an approach to unexpected abnormal laboratory test results.
4. Differentiate between the following types of tests:
   a. screening test
   b. diagnostic test
   c. monitoring test
5. Explain the difference between clinical sensitivity, clinical specificity, accuracy and precision.
6. Given the predictive value of a test, discuss the value of ordering the test on a patient.
7. Identify sources of variability in laboratory test results.
8. Identify sources of error in laboratory testing.
9. Describe the use of critical pathways in the investigation of disease.
10. Explain the importance of proper specimen collection.
11. Identify the major areas of the clinical laboratory and the types of testing associated with each.
12. Given a laboratory test reference range, identify the percentage of the population likely to fall in that range and the percentage likely to fall outside the normal reference range.
13. Identify panic or critical values and determine the appropriate response to these test results.
14. Discuss the appropriate use of stat tests.

Affective
1. Justify the need for proper specimen collection.
2. Justify the need for safe equipment when performing venipuncture.
3. Support the use of appropriate methods to minimize the risk of the biohazard exposure.

Psychomotor
1. Identify appropriate equipment for use in venipuncture.
2. Identify sites for the collection of venipuncture samples.
3. Compare the advantages and disadvantages of the vacutainer and syringe systems for blood collection.
4. Select appropriate blood collection tubes for common laboratory tests.
5. Correlate the color code on blood tubes with the additive present.
6. Utilize appropriate patient identification procedures.

Microbiology

Cognitive:
1. Describe the different types of urinary tract infections.
2. List several etiologic agents of urinary tract infections.
3. Describe the collection of clean catch urine specimens.
4. Interpret the findings from a laboratory report on a patient with a suspected urinary tract infection.
5. Describe the organisms commonly infecting the upper respiratory tract.
6. Describe the organisms commonly infecting the lower respiratory tract.
7. Describe the different cultures used in identifying respiratory tract infections, i.e., throat, nasopharyngeal, sinus, external ear, and middle ear.
8. Compare the use of serology and culture methods in diagnosis of strep infections.
9. Describe proper collection procedures for microbiological specimens.
10. Correlate gram stain and culture findings with appropriate disease processes.

Affective:
1. Explain the need for culture of a specimen.
2. Dispute inconsistent findings when comparing cultures to gram stain.
3. Dispute inconsistent findings when comparing results from a culture to the clinical presentation of the patient.
4. Demonstrate an acceptance of responsibility for his/her own learning by consistently preparing for lecture and laboratory sessions.
5. Accept constructive criticism as part of the learning process and act upon suggestions for improvement.
6. Demonstrate integrity by striving to perform to the best of his/her own ability, admitting mistakes and taking appropriate corrective action.

Urinalysis
Cognitive:
1. Identify the common screening tests that are part of a routine urinalysis, sources of error, and clinical significance of each.
2. Given the results of a routine urinalysis report, identify any discrepancies and determine an appropriate course of action.
3. Describe the correct procedure for the chemical analysis of urine.
4. Given a laboratory report of a routine urinalysis, including physical, chemical and microscopic results, identify normal and abnormal findings.
5. Describe the correct procedure for routine examination of urine sediment.
6. Correlate physical, chemical and microscopic examination of urine with the following conditions:
   a. Diabetes mellitus
   b. Nephrotic syndrome
   c. Acute glomerulonephritis
   d. Acute pyelonephritis
   e. Obstructive jaundice
   f. Hemolytic jaundice

Affective:
1. Question contaminated urine samples.
2. Demonstrate an acceptance of responsibility for his/her own learning by consistently preparing for lecture and laboratory sessions.
3. Accept constructive criticism as part of the learning process and act upon suggestions for improvement.
4. Demonstrate integrity by striving to perform to the best of his/her own ability, admitting mistakes and taking appropriate corrective action.

Clinical Chemistry:
Cognitive:
1. Describe the role of glucose in carbohydrate metabolism.
2. Identify tests used to assess carbohydrate metabolism.
3. Explain the criteria used in the classification of diabetes.
4. Select appropriate laboratory tests to evaluate cardiac, pancreatic, renal, skeletal muscle, electrolyte, lipid, liver and thyroid disorders.
5. Given the chemistry results from a patient, interpret the findings and identify appropriate follow-up laboratory tests.
6. Given a case study and the laboratory results, interpret the findings and determine the need for any further testing.
7. Identify critical values and respond appropriately.
Affective:
1. Justify the need to assess water and electrolyte balance.
2. Advocate the need to assess carbohydrate metabolism.
3. Justify the need for the proper classification of diabetes mellitus.
4. Defend the need for the assessment of cardiac and skeletal muscle enzymes.
5. Justify the need for appropriate laboratory evaluation of liver disease.
6. Demonstrate an acceptance of responsibility for his/her own learning by consistently preparing for lecture and laboratory sessions.
7. Accept constructive criticism as part of the learning process and act upon suggestions for improvement.
8. Demonstrate integrity by striving to perform to the best of his/her own ability, admitting mistakes and taking appropriate corrective action.

Psychomotor:
1. Perform random/fasting fingerstick glucose testing utilizing appropriate technique.
2. Given the patient and control values from a glucometer test, determine whether the results are acceptable.
3. Correlate venous and capillary glucose results.
4. Follow CLIA guidelines when performing waived testing.
5. Construct a general algorithm to evaluate a patient for the presence or absence of renal, heart, liver or pancreatic disorders.

Hematology
Cognitive:
1. Describe the key elements essential for the production of red blood cells.
2. List the components included in a CBC.
3. Describe the significance of each component of the complete blood count.
4. Correlate the findings from the reticulocyte count and peripheral blood smear.
5. Identify abnormal RBC and WBC morphologic findings.
6. Identify common causes of anemia and describe the associated findings.
7. Select appropriate tests to determine the cause of an anemia.
8. Describe the different types of white blood disorders and the significance of each.
   a. neutropenia
   b. neutrophilia
   c. lymphocytosis
   d. lymphocytopenia
   e. eosinophilia
   f. basophilia
9. Describe the following general types of leukemias.
   a. acute leukemia
   b. acute lymphoblastic leukemia
   c. acute myelogenous leukemia
   d. chronic myelogenous leukemia
   e. chronic lymphocytic leukemia
10. Given the hematology results on a patient, interpret the findings and identify the need for any additional testing.
11. Compare the FAB and WHO Classification for Leukemias.

Affective:
1. Defend the importance of each component of a complete blood count.
2. Defend the need for a reticulocyte count and a peripheral blood smear in an anemic patient.
3. Dispute inconsistent findings between a complete blood count and a peripheral blood smear.
4. Defend the need to identify the appropriate cause of an anemia.
5. Defend the need to differentiate the different types of white blood cell disorders.
6. Justify the need to differentiate the different types of leukemias.
7 Demonstrate an acceptance of responsibility for his/her own learning by consistently preparing for lecture
and laboratory sessions.
8. Accept constructive criticism as part of the learning process and act upon suggestions for improvement.
9 Demonstrate integrity by striving to perform to the best of his/her own ability, admitting mistakes and taking appropriate corrective action.

Psychomotor:
1. Construct a general algorithm, using the indices of a CBC, to evaluate a patient for the presence or absence of red cell disorders.
2. Interpret the findings from an automated diff.
3. Follow appropriate CLIA regulations when performing testing in a POL setting.
4. Identify appropriate procedures in order to comply with CLIA in a POL setting.

CLINICAL LABORATORY METHODS CLSC 5227
TENTATIVE LECTURE SCHEDULE SPRING 2018

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<td>Introduction to the Laboratory in Primary Care</td>
<td>Chapter 1</td>
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<td>January 21</td>
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<td>Open Jan 21-Jan 25</td>
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<td>January 28</td>
<td>Routine Urinalysis</td>
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<td>Microbiology</td>
<td>(Quiz 4 Micro)</td>
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<td>Clinical Chemistry Test Utilization</td>
<td>Chapter 3 (Unit Two)</td>
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<td><strong>February 25</strong></td>
<td>Lecture Exam Over Unit One (Does not cover Chem Lecture 1)</td>
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<td>Clinical Chemistry Test Utilization</td>
<td>Chapter 4, 5 (Quiz 6 Chem)</td>
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<td>Chapter 6, 12 (Quiz 7 Chem)</td>
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<td>Clinical Chemistry Test Utilization</td>
<td>Chapter 13, 14 (Quiz 8 Chem)</td>
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<td>Lecture Exam Over Unit Two</td>
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<td><strong>Unit Three</strong></td>
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<td>April 8</td>
<td>Testing for Hematologic Disorders</td>
<td>Chapter 9 (Quiz 9 Chem)</td>
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<td>April 15</td>
<td>Testing for Hematologic Disorders</td>
<td>Chapter 10 (Quiz 10 Chem)</td>
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<tr>
<td>April 22</td>
<td>Testing for Hematologic Disorders</td>
<td>Chapter 10 (Quiz 10 Chem)</td>
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<td><strong>April 29</strong></td>
<td>Lecture Exam Over Unit Three</td>
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<tr>
<td>TBD</td>
<td>Final Comprehensive Exam</td>
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Library MTS Training
https://www.medtraining.org/ltac3/Account/userTrainingMenu.aspx
<table>
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<th>Date</th>
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<td>January 18</td>
<td>Safety Introduction to Laboratory CLIA, POL</td>
<td>MTS Biosafety Tutorial and Quiz MTS Basic Phlebotomy Tutorial</td>
<td>MTS Biosafety Quiz Due MTS Basic Phlebotomy Quiz Due</td>
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<tr>
<td>January 25</td>
<td>Phlebotomy Training and Competencies UA dipsticks Review of UA microscopics</td>
<td>MTS Basic Urinalysis/sediment Tutorial Quiz</td>
<td>MTS UA Quizzes due Turn in UA results</td>
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<tr>
<td>February 1</td>
<td>Strep Testing, Gram Stain Phlebotomy</td>
<td>MTS Gram Stain Tutorial</td>
<td>MTS Gram Stain Quiz Due Turn in Strep results</td>
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<td>February 8</td>
<td>TAPA Conference</td>
<td>Case studies assigned to 4 Lab groups of 4 subgroups</td>
<td>NO LAB</td>
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<tr>
<td>February 15</td>
<td>Phlebotomy Training and Competencies KOH testing</td>
<td>MTS KOH tutorial</td>
<td>MTS KOH tutorial quiz due Turn in KOH testing</td>
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<tr>
<td>February 22</td>
<td>Phlebotomy Training and Competencies Pregnancy Testing</td>
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<td>Turn in Pregnancy results</td>
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<tr>
<td>March 1</td>
<td>Glucometer Testing Phlebotomy Training and Competencies</td>
<td>Quiz Over CLIA, POL, Glucometer Turn in Glucometer results</td>
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<tr>
<td>March 8</td>
<td>Phlebotomy Training and Competencies</td>
<td>MTS Basic Hematology Quiz Due</td>
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<td>March 11-16</td>
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<td>March 22</td>
<td>Phlebotomy Training and Competencies Hgb Testing</td>
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<td>Turn in Hgb test results</td>
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<tr>
<td>March 29</td>
<td>Good Friday</td>
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<tr>
<td>April 5</td>
<td>Automated Differential Interpretation Phlebotomy Training and</td>
<td>CBC test result assigned in lab for review</td>
<td>Turn in CBC result interpretation</td>
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<tr>
<td>April 12</td>
<td>Hct Testing Phlebotomy Training and Competencies</td>
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<td>Turn in Hct results</td>
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<tr>
<td>April 19</td>
<td>LAB will be from 1-5</td>
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<td>Case study presentations</td>
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<tr>
<td>April 26</td>
<td>Lab will be from 1-5</td>
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<td>Case study presentations</td>
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