INSTRUCTOR: Prof: Sandra L. Tijerina, M.S., MLT (ASCP)^cm SBB^cm, SH^cm  
Office - 2.118 Phone # - 665-2289  
Email: Sandra.tijerina@utrgv.edu  
Office hours – MON 1:00PM-2:30PM  
TUE 9:00AM-10:00PM  
WED 9:00AM -10:00AM

COURSE: CLSC 4314 Advanced Immunohematology

PREREQUISITE: Admission into the Clinical Laboratory Science Program and CLSC 3513

CREDIT HOURS: 3

COURSE DESCRIPTION: Lecture and laboratory stress the detection, identification and characterization of rarer and atypical antigens and antibodies, compatibility testing, blood component therapy and problem solving techniques. 2 hours of lecture and 5 hours of lab.

FREQUENCY OF OFFERING: Spring

TEXTBOOK(S):  
1. Rittenhouse-Olsen and De Nardin, Contemporary Clinical Immunology and Serology. 1st Ed. Pearson, 2013  
ADDITIONAL REFERENCES
(Office Reserve or Library)
1. STANDARDS: for Blood Banks and Transfusion Services, 27th ed., 2011
2. Introduction to the ABO Group System - A Self Instructional Unit Newkirk and Coggins.

Internet Resources
2. http://www.ualberta.ca/~pletendr/bb.html -very complete list of blood bank resources

METHODS OF EVALUATION:

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<th>Lecture:</th>
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<td>Daily Lab Reports</td>
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<tr>
<td>Case studies</td>
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</table>

Aff. beh. 3% 100%

A = 90 - 100%
B = 80 - 89%
C = 70 - 79%
D = 65 - 69% *
F = below 65% *

*Not acceptable to meet Program requirements.

STUDENTS MUST PASS THE LECTURE, LABORATORY AND AFFECTIVE PORTIONS OF THE COURSE WITH AT LEAST A "C" AVERAGE. SHOULD A STUDENT NOT RECEIVE A PASSING AVERAGE IN ANY SECTION, THE LOWER OF THE GRADES WILL BE USED TO ASSIGN THE FINAL GRADE. FOR LECTURE, EXAMS AND FINAL MUST TOTAL AT LEAST 70% IN ORDER FOR QUIZZES AND HOMEWORK TO BE AVERAGED IN. FOR LAB, PRACTICALS MUST TOTAL AT LEAST 70% IN ORDER FOR LAB REPORTS AND CASE STUDIES TO BE AVERAGED IN.

COURSE REQUIREMENTS:

1. Students are expected to participate actively in each learning activity in lab and lecture. The student is expected to participate actively in each class session. Satisfactory
completion of all laboratory exercises is required. Should a student find it necessary to miss a laboratory, it is the student’s responsibility to make arrangements for completion of the work.

2. All students must adhere to the safety rules of the laboratory. Students will not be allowed to participate in the laboratory without proper attire. Gloves must be worn at all times. Adherence to safety regulations will be evaluated as part of the affective grade.

3. Affective objectives will be evaluated using the attached evaluation form. The purpose of this evaluation form is to develop the professional attributes expected of students during the clinical portions of the program.

4. Students will be assigned certain tasks in the laboratory on a rotating basis which will be included as part of the affective evaluation. These duties may include quality control, instrument start-up, reagent preparation and lab cleanup, as well as safety inspections. The purpose of these assignments is to instill professional attitudes such as a sense of teamwork and responsibility. Also included in the affective grade will be the completion of homework assignments and study questions, safety compliance and attendance.

5. Responsibility for assigned tasks is an important attribute. All assignments are due at the beginning of class unless otherwise noted. Assignments that are turned in after this time will be dropped five points per day.

6. Students are expected to attend class and be present for all exams. Should an emergency or severe illness arise, students will be expected to notify the instructor prior to the scheduled exam period or as soon as it is feasible. If there is evidence of abusing the attendance policy, acceptable written documentation justifying the absence may be required in order to take a makeup exam or the exam grade will be dropped by one letter grade.

7. Students will be given a weekly quiz online. The lowest quiz grade will be dropped from the final quiz grade average. No makeups for quizzes will be given.

8. Students are expected to arrive on time. Three instances of being tardy will be considered as one absence. Students who have more than three unexcused absences in a semester may be dropped from the class by the instructor.

9. 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 the classroom, students are prohibited from engaging in any form of disruptive behavior such as the use of cellular phones and beepers during class, arriving late or leaving class early, missing deadlines, prolonged chattering, reading other materials during class, and making offensive remarks to fellow students or faculty. Inappropriate behavior in the classroom or laboratory 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.

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 2018 Module 1 February 13 – February 19
Spring 2018 Module 2 April 10 – April 16
Spring 2018 (full semester) April 10 – May 1

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.

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.

VAQUERO HONOR CODE

Honesty, Integrity, & Respect
As members of a community dedicated to honesty, integrity, and mutual respect in all interactions and relationships, the students, faculty and administration of our university pledge to abide by the principles in the Vaquero Honor Code.

- WE ARE HONEST
  We do our own work and are honest with one another in all matters. We understand how
any act of dishonesty, including cheating, plagiarizing, falsifying data, and giving or receiving unauthorized assistance, conflicts as much with academic achievement as with the values of honesty and integrity.

- **WE HAVE INTEGRITY**
  We do not lie, cheat, steal, or tolerate those who do. We will make personal and academic integrity fundamental in all of our endeavors.

- **WE ARE RESPECTFUL**
  We act civilly and cooperate with one another for the common good. We will strive to create an environment and a culture in which people respect and listen to one another. We recognize a university is, above all, a place for the exchange of ideas, popular and unpopular. It is the one institution in society that encourages challenges to conventional wisdom. Consequently, we pledge to encourage the exchange of ideas and to allow others to participate and express their views openly.

**The Vaquero Student Honor Statement:**
I pledge I will not cheat, plagiarize, falsify data or give or receive unauthorized assistance on academic work in accordance with the Vaquero Honor Code. I further pledge to support a culture of academic integrity.

**Student Guidelines**
The student is responsible for seeking a better understanding of any of the concepts discussed above by consulting with a faculty member; visit the library website, and/or calling the Dean of Students Office at 956-665-2260. Violations of the Vaquero Honor Code should be reported to the faculty in charge of the course or Student Rights and Responsibilities. The identity of the student reporting violations of the Vaquero Honor Code will be confidential until such time as the student chooses to have their identity revealed. The Student Hearing Process and Appeal Procedures outlined in section STU 02–100 of the Handbook of Operating Procedures outlines the rights afforded to students who are accused of violating the Student Conduct and Discipline and the Vaquero Honor Code.

**The Vaquero Faculty Honor Statement**
I recognize students' rights and pledge to uphold the principles of honesty, integrity, and mutual respect in all interactions and relationships at UTRGV. I pledge to follow the Faculty Guidelines (see below) in treating student academic misconduct.

**ATTENDANCE:**
Students are expected to attend all scheduled classes and may be dropped from the course for excessive absences. 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.

**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.

ADVANCED IMMUNOHEMATOLOGY
CLSC - 4314
OBJECTIVES

OVERALL PROGRAM STUDENT LEARNING OUTCOMES:
1. Demonstrate entry level knowledge and skills in the area of hematology.
2. Demonstrate entry level knowledge and skills in the area of clinical chemistry.
3. Demonstrate entry level knowledge and skills in the area of immunohematology.
4. Demonstrate entry level knowledge and skills in the area of clinical microbiology.
5. Demonstrate entry level knowledge and skills in the area of immunology.
6. Demonstrate entry level knowledge and skills in the area of urinalysis and body fluids.

AFFECTIVE OBJECTIVES: Upon completion of the laboratory and lecture sections of this course, the student should be able to:
1. Show a concern for his/her own safety as well as those of fellow students by adhering to established safety rules.
2. Demonstrate dependability by attending all lecture and laboratory sessions and arriving promptly at the designated time.
3. Follow instructions on procedures and use of materials.
4. Demonstrate an acceptance of responsibility for his/her own learning by consistently preparing for class and laboratory sessions, voluntarily seeking information; asking pertinent questions and setting personal priorities to allow for academic success.
5. Show initiative by completing assigned tasks without reminders and seeking additional tasks as appropriate.
6. Listen attentively during class activities and actively participate in class.

LECTURE OBJECTIVES:
At the conclusion of this course, the student will be able to:
1. Calculate the most probable genotype for a set of blood group results.
2. Discuss the use of lectins in A subtyping.
3. Given the results of an AB0 typing, analyze the findings and determine the group or subgroup present.
4. Given an ABO discrepancy, determine the most appropriate course of action.
5. Relate changes in antigen-antibody findings to changes in a person's health status.
6. Evaluate the results of an ABO typing discrepancy and determine possible causes.
7. Explain the formation of the "Bombay" blood type including genetics, antigens, antibodies
Discuss the use of secretor testing as a problem solving technique.

Categorize the relative frequencies of Rh antigens Rh:1 to Rh:6 as well as rh:12.

Discuss the clinical importance of the Rh and LW systems including antigens and antibodies.

Given the results of antigen typing and using probability charts, identify the most likely genotype.

Compare and contrast reactivity, thermal range, incidence, inheritance and clinical significance of LW, G, f, Null phenotype, Super D antigens and antibodies

Compare and contrast "public" and private antigens and describe their significance in crossmatching.

Explain the significance of HTLA antibodies.

Calculate combined Antigen probabilities.

Given a patients type and/or other information, evaluate the findings and determine the most appropriate units of blood to select for transfusion.

Evaluate results from an incompatible crossmatch and/or other case related information and identify an appropriate course of action.

Determine any necessary changes in blood group types for transfusion according to AABB recommendations.

Compare the special requirements for pediatric transfusions to those of adults.

Justify the importance of the "Look Back" policy.

Describe the major dangers to the infant with severe HDN and identify when they occur.

Given a mother and baby's type and the presence of specific isoagglutinins, select suitable donor types for exchange.

Given the results of a Kleihauer-Betke stain, calculate an appropriate Rho-Gam dose.

Discuss the use and interpretation of the following:
   a. titers
   b. amniocentesis – biliscan, Lily Graph, L/S ratio
   c. IUT

Given case histories, determine which patients are Rho-Gam candidates.

Compare the various blood components including separation, storage requirements and use.

Given a case history and/or other information, select the component of choice.

Given different mechanisms for drug induced serological problems, classify each one.

Differentiate elution and absorption techniques and their uses.

Given the results of laboratory testing, determine if polyagglutination is present.

Given results of lectin typings, identify the type of polyagglutination.

Compare and contrast the following:
   absorption
   adsorption
   elution

Select appropriate enhancement media for use in the identification of atypical antibodies.

Given different antibody classes, select the appropriate mechanical or chemical elution agents in order to make an identification.

Given multiple antibodies, choose a selected cell panel for identification.

Compare and contrast antibody-antigen potentiators and special reagents for Ab I.D.

Select appropriate blood donors according to AABB criteria.
40. Given direct antiglobulin test results, choose appropriate courses of action.
41. Identify appropriate techniques for paternity testing.
42. Compare and contrast gel technology, column affinity technology and solid phase technology.
43. Describe the FDA and AABB quality assurance regulations as they relate to the practice of Immunohematology.

LABORATORY OBJECTIVES
At the conclusion of these labs, the student will be able to:

1. Prepare 2-5% cell suspensions as compared to the standard provided by the instructor.
2. Given a minimum of 15 samples of blood, determine the correct blood group using the tube method plus reverse grouping, recording and correctly interpreting the results with 100% accuracy.
3. Given 2 unknown samples of blood, determine the subgroups of A or AB using anti-A lectin.
4. Given the results of serum and cell groupings the student will with 100% accuracy identify those in which discrepancies are present.
5. Identify possible causes of discrepancies including errors in technique, serum problem and cell problem.
6. Given case histories of serum and cell groupings in which discrepancies are present, outline the procedures which may be used to resolve the problems.
7. Perform H lectin typings on different ABO blood types.
8. Perform secretor and Rh testing on specimens and determine the presence or absence of the D variant where applicable.
9. Determine appropriate action in the presence of a positive control during Rh and D testing.
10. Differentiate between the direct and indirect antiglobulin tests and identify appropriate uses for each.
11. Perform cell washing techniques correctly as indicated by the addition of check cells.
12. Grade and interpret antibody-antigen reactions according to the established criteria in the laboratory manual.
13. Perform direct and indirect coombs tests on appropriate specimens, grading and recording the results with 100% accuracy.
14. Describe the preparation and use of "check cells". (AHG control cells)
15. Identify sources of error in antiglobulin testing.
16. Given a patient specimen, select the most appropriate blood for transfusion and perform compatibility testing with 100% accuracy.
17. Perform appropriate testing on cord bloods including direct coombs, group and Rh, and antibody identification.
18. Identify possible sources of error in cord blood testing.
19. Given a serum sample, perform antibody screening procedures with 100% accuracy.
20. Using a cell panel, perform antibody identification procedures and correctly interpret the results for both non-enzyme and enzyme panels.
21. Identify appropriate techniques that may be used to aid in the identification of antibodies.
22. List the antibodies most likely to react in each media or at each stage of a identification panel.
23. Describe required quality assurance procedures and list materials and expected reactions for all routinely used reagents.
24. Identify multiple antibodies in serum specimens.
25. Perform and interpret QC procedures, determining appropriate course of action.
26. Identify problems in pre-analytic, analytic and post-analytic testing in blood bank and determine appropriate corrective action.
26. As part of community engagement/service learning, set up and sponsor a donor blood drive in association with United blood Service.

CLSC 4314
IMMUNOHEMATOLOGY
Lecture Schedule

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<tr>
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<td>Mar 19</td>
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<tr>
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<td>Mar 27</td>
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<td>Chapter 10</td>
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<tr>
<td>Mar 29</td>
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<tr>
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<td>Apr 1</td>
<td>Component prep/therapy</td>
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<td>Apr 2</td>
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<td>Apr 10-12</td>
<td>TACLS</td>
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<tr>
<td>Mar 19</td>
<td>Set up lab, ABO and Rh typing/Gel and Tube</td>
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<tr>
<td>Mar 20</td>
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<td>Mar 26</td>
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<td>Selected cell panels</td>
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<td><strong>Practical I: Part I 10:50-12:05</strong></td>
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<td>Panel hetero vs homo</td>
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Chapter 22

Chapter 12

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