CLINICAL LABORATORY SCIENCES
CLSC 3513 Clinical Immunology and Immunohematology
The University of Texas Rio Grande Valley
Fall 2018

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T/Th 9:00AM-10:00AM
W 11:00AM-12:00PM

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Office Hours: TBA

COURSE:  CLSC 3513 Clinical Immunology and Immunohematology

PREREQUISITE:  Acceptance into the Clinical Laboratory Science Program or special approval

CREDIT HOURS:  5

CONTACT HOURS:  Lecture: 4 hours per week
Lab: 3 hours per week

COURSE DESCRIPTION:  Basic aspects of the immune response, human genetics and its relationship to the diagnosis and treatment of disease. Lecture and laboratory stress the basic concepts of the human immune system as well as clinical applications in the detection and diagnosis of disease processes by common serological tests including immunohematology applications.

FREQUENCY OF OFFERING:  Fall Semester only
TEXTBOOK(S): 1. Rittenhouse-Olsen and De Nardin, Contemporary Clinical Immunology and Serology. 1st Ed. Pearson, 2013
3. Required Manuals Provided: Laboratory Exercises in Immunology Blood Bank Laboratory Manual

ADDITIONAL REFERENCES (Office Reserve or Library)

METHODS OF EVALUATION:

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<thead>
<tr>
<th>Component</th>
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<td>Affective behavior</td>
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GRADING SCALE
A = 90 - 100%
B = 80 - 89%
C = 70 - 79%
D = 65 - 69% * Not acceptable to meet
F = below 65% * Program requirements.

STUDENTS MUST PASS ALL THE LECTURE, LABORATORY AND AFFECTIVE PORTIONS OF THE COURSE WITH AT LEAST A "C" AVERAGE. SHOULD A STUDENT NOT RECEIVE A PASSING AVERAGE IN A SECTION, THE LOWEST OF THE GRADES WILL BE USED TO ASSIGN THE FINAL GRADE! Quizzes, case studies, HW, etc. will not be averaged in unless student is passing lecture and/or lab exams.

COURSE REQUIREMENTS:
1. There will be no makeups for lab sessions without a written doctor’s excuse.
2. This is a web augmented course. Blackboard tools such as the Discussion Tool, the assessment Tool, the Assignment tool and Tegrity will be utilized at various times throughout the course. Students may access copies of the power point handouts via blackboard.
3. Affective objectives will be evaluated using the program affective evaluation form. The purpose of this 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. Also included in the affective grade will be completion of homework assignments and study questions, safety compliance and attendance.

5. 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.

6. Students are expected to develop professional attitudes and responsibilities. Therefore attendance is considered as part of the students' overall affective course grade. The student is expected to be on time and attend all lecture and laboratory sessions. Make ups for exams will only be considered when documentation of a legitimate family emergency or severe illness is presented to the instructor. **No makeups for quizzes will be given.**

7. **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.

8. Assignments are normally due at the beginning of class. Assignments turned in after class on the assigned date will have the grade dropped 10 per cent per class day unless a doctors' excuse or suitable excuse is presented to the instructor. **Quizzes, case studies, HW, etc. will not be averaged in unless student is passing lecture and/or lab exams.**

9. For this course we will be using the Turning Technologies Response pad system. These are clickers that students use to key in responses to a professor’s questions. They work like remotes and provide the professor with instant feedback of student understanding of lecture content. For example, quizzes can be taken right on the spot which will indicate the level of comprehension of the material. Response pads and codes are available at the University Bookstore. Individuals who already have a compatible response pad system will be able to use the system for this class and do not need to purchase another pad. If you don’t have a Turning Technologies response pad, you will need to purchase a response pad from the bookstore or online at [www.turningtechnologies.com](http://www.turningtechnologies.com). If you purchase your pad online you will need the code for UTRGV which is utrgv (all lower case).

10. **Students will be expected to have a laptop or Ipad for taking major exams on line.** Exams will be administered during exam periods in class.
12. 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.

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: **Nov 14 – Dec 5** for full fall semester courses.

IMPORTANT DATES:

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<tr>
<th>Date</th>
<th>Event Description</th>
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<tr>
<td>Aug 27</td>
<td>Fall classes begin</td>
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<td>Aug 30</td>
<td>Last day to add or register for Fall classes</td>
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<td>Aug 31</td>
<td>Last day to withdraw (drop all classes) for a 80% refund</td>
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<td>Sept 12</td>
<td>Census day (last day to drop without it appearing on the transcript)</td>
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<td>Nov 26 - Nov 24</td>
<td>Thanksgiving Holiday, no classes</td>
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<td>Dec 6</td>
<td>Study Day, no classes</td>
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<td>Dec 7 – Dec 13</td>
<td>Final Exams</td>
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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.

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.

MAJOR STUDENT LEARNING OUTCOMES:

Upon completion of the laboratory and lecture sections of this course, the student should be able to:

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 achieve the following 6 objectives. Achievement will be met when a minimum score of 70% percent is earned on critical objectives marked with an asterisk. See next page.
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.

Upon completion of this course and without the aid of notes or textbook, the student should be able to achieve the following Lecture and Laboratory Objectives. Achievement will be met when a minimum score of 70% percent is earned as detailed in the methods of evaluation section of this syllabus.

LECTURE OBJECTIVES:

**General Immunology**
1. Differentiate between natural and adaptive immunity.
2. Identify the major components of the natural immune system.
3. Identify the major components of the adaptive immune system.
4. Identify modifying factors which may affect the immune response.
5. Discuss the functions of the immune system.
6. Differentiate between humoral and cellular immunity.

**Antigens and Antibodies**
1. Define antigen and antibody.
2. Describe the characteristics of an antigen.
3. Differentiate between active and passive immunity.
4. Define the following terms:
   a. adjuvant  
   b. anamnestic response 
   c. hapten  
   d. mitogen  
   e. epitope  
   f. affinity  
   g. avidity  
   h. monoclonal antibody  
   i. cross reactivity
5. Compare and contrast the characteristics of the five classes of immunoglobulins.
6. Diagram the structure of the immunoglobulins, indicating the major structural parts and their function.
7. Differentiate the roles and functions of the various immunoglobulin classes.
8. Correlate physical characteristics of the immunoglobulins with their role in the immune response.
9. Differentiate between the various stages of the immune response based on the type of antibody present.
10. Relate the properties of the immunoglobulins to their use in the laboratory.
11. Correlate elevated levels of IgM in the newborn with clinical significance.
12. Compare and contrast the primary and secondary response with regard to:
   a. principle antibody
   b. titer
   c. duration
   d. lag phase

13. Predict the antigenicity of a substance based on the general characteristics of antigens.

**Cells and Cellular Activities of the Immune System**

1. Describe the role of the granulocytes and mononuclear cells in host defense.
2. Identify the signs and symptoms of abnormal neutrophil monocyte/macrophage function.
3. Discuss the major applications of acute phase protein measurements.
4. Identify examples of acute phase proteins
5. Differentiate between primary and secondary lymphoid tissues.
6. Differentiate between the functions of T, B and NK cells in the immune response.
7. Given the major antigenic determinants present on a cell, identify the type of cell present.

**Soluble Mediators of the Immune System**

1. Describe the role of complement in the immune system.
2. Differentiate between the function of the classic and alternate complement pathway.
3. Identify origin and biologic activity of major cytokines.
4. Define interleukin and interferon.
5. Identify the components of the complement pathways and their function.
6. Diagram the sequence of events in complement activation.

**Theory of Immunologic and Serologic Tests**

1. Distinguish between precipitation and agglutination.
2. Correlate factors which influence the precipitation and agglutination reaction to false positives and negative results.
3. Compare and contrast the following precipitation techniques:
   - EID or Rocket technique
   - CIE
   - Ouchterlony Test
4. Given the result from one of the procedures listed above, interpret the result.
5. Differentiate between passive agglutination, direct agglutination, co-agglutination, reverse passive agglutination and hemagglutination inhibition.
6. Differentiate between prozone, postzone and zone of equivalence.
7. Relate the characteristics of the above zones to the design of laboratory tests.
8. Compare and contrast polyclonal and monoclonal antibodies.
9. Explain the complement fixation test.
10. Given the results from a complement fixation test, interpret the result.
11. Compare and contrast the types of labels used in immunoassay procedures.
12. Describe the principle of the common solid phase sandwich enzyme immunoassay or ELISA.
13. Differentiate between the following Immunofluorescent assays:
   a. direct immunofluorescent assay
   b. Indirect immunofluorescent assay
   c. Sol particle immunoassay (SPIA)
**Syphilis**
1. Identify the causative agent for syphilis.
2. Differentiate between the stages of syphilis including the symptoms and expected test results.
3. Identify the three general types of laboratory tests useful in the diagnosis of syphilis.
4. Briefly describe the procedure for the RPR, VDRL, FTA- abs, TPI, microhemagglutination and ELISA tests.
5. Compare the advantages and disadvantages for the above tests.
6. Identify conditions which may produce a BFP reaction.
7. Correlate the development and appearance of antibodies in syphilis with laboratory testing.
8. Given the results from laboratory tests and case history information, interpret the results.
9. Given the results from laboratory tests, including QC data, analyze the information and identify any additional tests necessary.

**Bacterial Serology One**
1. Identify the antigens commonly included in a febrile agglutinin battery.
2. Explain the principle of febrile agglutinin tests.
3. Compare the types of agglutination seen in febrile tests.
4. For the following serologic reactions, identify the antigen:
   - Widal
   - Weil Felix
   - Huddleston
5. Identify the effect of each of the following on the interpretation of febrile results:
   a. vaccination
   b. cross reactivity
   c. endemic location
   d. immunologic deficiency
6. Given the results from a febrile agglutinin and case history information, interpret the results.
7. Given results from febrile studies, identify any follow-up or confirmatory tests necessary.
8. Troubleshoot problems in the interpretation of febrile agglutinins and identify appropriate corrective action.

**Bacterial Serology Two**
1. Describe the morphologic characteristics of S. pyogenes.
2. Identify extracellular products and antibodies which may be seen following streptococcal infection.
3. Discuss the epidemiology of S. pyogenes.
4. Discuss the diagnostic evaluation of a suspected strep infection.
5. Describe the principle of the ASO latex test.
6. Predict the affect of possible procedural errors on laboratory tests.
7. Compare the clinical use of the ASO, streptozyme, and anti-DNase B procedures.
8. Explain the principle of the anti-hyaluronidase test and its significance.
9. Given the results from laboratory tests and case history information, interpret the information.
10. Given case history information, plan any additional testing justifying your recommendations.

**Bacterial Serology Three**
1. For the following bacteria, correlate the clinical findings and associated disease states:
   a. Helicobacter Pylor
   b. C. Difficile
   c. Borellia burgdorferi
2. For the following bacteria, identify the mechanism of disease production:
   a. Helicobacter Pylor
   b. C. Difficile
For the following bacteria, identify distinguishing characteristics:
c.  *Borellia burgdorferi*

For the following bacteria, identify appropriate laboratory tests:
a.  *Helicobacter Pylori*
b.  *C. Difficile*
c.  *Borellia burgdorferi*

Given a case study and appropriate diagnostic tests, interpret the findings.

Identify the mode of transmission for Lyme Disease.

**Herpesviridae**
1. Identify the viruses that belong to the Herpesviridae family.
2. Describe the key characteristics of each of these viruses.
3. Identify appropriate laboratory diagnostic tests.
4. Describe the etiology, epidemiology and signs and symptoms of diseases caused by each of these viruses.
5. Identify the antibodies which are seen with infectious mononucleosis.
6. Compare the principles of the presumptive (Paul-Bunnell) and Davidsohn differential tests for mono.
7. Given the results of a heterophile or heterophile absorption test, interpret the results.
8. Relate the principle of the common slide tests for mono to classic methodology.
9. Given the results from laboratory tests and case history information, identify any additional tests which are indicated.
10. Identify the diseases associated with TORCH Syndrome, causes and significance.
11. Identify appropriate laboratory tests for diseases caused by viruses in this family.
12. Given a case history and the results from laboratory tests, interpret the results.

**Other Viruses**
1. Differentiate between rubella and rubeola regarding causative agent and disease characteristics.
2. Identify the causative agent for rubella, rubeola, mumps.
3. Select appropriate laboratory testing for viral disorders discussed in lecture.
4. Identify the cause of West Nile Fever and the mode of transmission.
5. Differentiate between the causative agents of influenza.
6. Discuss reasons why there are repeat waves of influenza.
7. Differentiate between antigenic shift and antigenic drift.

**Miscellaneous Tests**
1. Describe the properties of cold agglutinins.
2. Explain the principle the cold agglutinin procedure.
3. Identify sources of false positive or negative results.
4. Correlate an increased titer of cold agglutinins to possible disease states.
5. Given a case history and the results from a cold agglutinin interpret the results.
6. Describe methods for measuring CRP.
7. Correlate the results of CRP tests with other laboratory tests.
8. Given the results of a CRP test, interpret the findings.
**Pregnancy Testing**
1. Discuss the origin, structure and effect of HCG.
2. Compare the principle, sensitivity and advantages/disadvantages for common pregnancy tests.
3. Differentiate the HCG levels found in each of the following
   a. normal pregnancy
   b. ectopic pregnancy
   c. hydatiform mole
4. Identify possible sources of error in HCG tests.
5. Given a case history and laboratory test results, interpret the findings.

**Genetics**
1. Apply the Mendelian laws in the inheritance of disease and antigens.
2. Explain the following terms:
   - alleles
   - phenotype
   - genotype
   - genes
   - homozygous
   - linkage
   - mutation
   - somatic mutation
   - sex-linked
   - recessive
   - mitosis
   - consanguineous
   - meiosis
   - dominant
   - autosomes
   - chromosomes
   - heterozygous
   - locus
   - diploid
3. Explain the laws of independent segregation and random assortment.
4. Correlate the concepts of dominant and recessive traits with examples of the inheritance of blood group antigens and diseases.
5. Explain the Hardy Weinberg principle and how it applies to genetic traits.
6. Determine the inheritance pattern of a given trait by examining the pedigree analysis.
7. Distinguish between x-linked and autosomal traits and describe how each is inherited.
8. Describe the mechanism for genetic mutations and how they can change the human genome.
9. Describe how genetics can be used in the laboratory.

**Intro to Immunohematology**
1. Explain the following concepts and their importance in the blood bank lab:
   - zeta potential
   - dielectric constant
   - plane of shear
2. Apply the principles of immunology to the study of blood groups.
3. Describe methods used to detect antigen/antibody reactions in the blood bank laboratory.
4. Evaluate methods of potentiating antigen/antibody reactions including albumin, enzymes, Liss, AHG, PEG, solid phase, ELISA and gel.
5. Describe the steps in an antigen-antibody reaction and the factors which affect this process.
6. Discuss the clinical significance of blood group antibodies and antigens.
7. Describe the structure of the red cell membrane.

**ABO AND H Blood Group System**
1. List the antigens and antibodies of the AB0 system.
2. Describe the structure and formation of antigens within the system.
3. Discuss the origin and development of ABO antibodies.
4. Identify optimal conditions for antigen-antibody reactions in the system.
5. Justify the importance of the ABO system in transfusion.
6. Given the ABO phenotype or genotype of the parents, determine the possible genotype or phenotype of the children.
7. Given the results of an ABO typing, analyze the findings and determine the blood group present.
8. Given the results of an ABO typing, evaluate the findings and determine the need for further testing.
9. Select appropriate reagents and methods for use in ABO typing.
10. Compare the quantity of H present on RBC’s in various blood groups.

**RH Blood Group System**
1. Discuss the clinical significance of the Rh system.
2. Compare and contrast the following theories of inheritance for the Rh system:
   - Fisher Race
   - Weiner
   - Rosenfeld
   - Tippett
3. List the major antigens in the Rh system using the Fisher Race Nomenclature.
4. Given an antigen in the Fisher Race system, identify the appropriate name in the Weiner and Rosenfeld nomenclature.
5. Compare and contrast the composition and use of Rh reagents
7. Given the results of an Rh typing, evaluate the findings and determine followup testing if needed.
8. Compare the frequency of the common Rh antigens.
9. Discuss the significance of the Du antigen and its detection.
10. Identify circumstances that might result in a weakened expression of the D antigen.
11. Identify circumstances which might result in false positive or false negative results for Rh typing.

**Other Antigen Systems**
1. Identify the most important antigenic determinants for each of the following blood groups:
   a. MNS
   b. P
   c. Kell
   d. Lewis
   e. Duffy
   f. Lutheran
   g. Kidd
   h. I
2. Identify the important antibodies in each of the blood group systems listed above.
3. Compare and contrast the reactivity, thermal range, incidence, inheritance and clinical significance for each of the above systems.
4. Compare and contrast “public” and “private” antigens and their significance in the clinical laboratory.
5. Briefly discuss the following high incidence antigenic determinants: Vel, Sid, Ena
6. Explain the significance of HTLA antigens.
7. Determine the need for any special testing procedures useful in the detection and/or identification of irregular antibodies.
8. Relate any disease association with antigenic determinants.
9. Differentiate between cold and warm reactive antibodies.

**Detection of Unexpected Antibodies**
1. Describe the basic antibody screen.
2. Given antibody screening results, determine the most likely class of antibody present, and any necessary follow-up testing.
3. Compare and contrast the use of potentiators in antibody screening.
4. Define the terms:
   - unexpected antibody
   - alloantibody
   - clinically significant antibody
   - autoantibody
5. Discuss factors which make an antibody clinically significant.
6. Interpret the results of an antibody screening procedure

**Compatibility Testing**
1. Define compatibility testing and identify procedures that constitute routine compatibility test.
2. Given the results of a crossmatch, analyze the findings and determine the most appropriate course of action.
3. Compare and contrast the use of potentiators in crossmatching.
4. Given a patient's type, select the most appropriate units of blood to crossmatch.
5. Describe the AABB standards for the following:
   a. information required on blood/component request form
   b. required labeling of sample
   c. testing of recipient blood
   d. repeat testing of donor blood
   e. retention of blood samples
   f. required information on the blood transfusion form and unit tag
6. Define the term major crossmatch.
7. Discuss the limitations of the compatibility test.

**Adverse Effects of Blood Transfusion**
1. Define the term transfusion reaction
2. Describe the pathophysiology of immune hemolysis.
3. Describe the symptoms, management and prevention of immune hemolytic transfusion reactions
4. Describe the symptoms, management, and prevention of the following immune nonhemolytic transfusion reactions:
   a. febrile
   b. allergic
   c. anaphylactic
   d. noncardiogenic pulmonary

**LABORATORY OBJECTIVES:**
1. Perform serologic procedures using appropriate written instructions and package inserts.
2. Correctly interpret the results for each of the following with 100% accuracy:
   - Cold Agglutinins
   - CRP
   - RPR
   - RA
3. Identify sources of error or interference in serologic procedures.
4. Prepare cell suspensions of 2-5% concentration as compared to the standard provided by the instructor.
5. Determine the correct blood group using both the tube and gel techniques recording and correctly interpreting the results with 100% accuracy.
6. Perform Rh testing determining the presence or absence of the D variant with 100% accuracy.
7. Grade and interpret antibody-antigen reactions according to the established criteria in the laboratory manual.
8. Given a serum sample, perform and interpret direct and indirect antibody screening procedures with 100% accuracy.
9. Perform antibody screening procedures according to the designated procedure and correctly interpret the results.
10. Given a patient specimen for compatibility testing, select appropriate blood with 100% accuracy.
11. Given a patient specimen, perform compatibility testing with 100% accuracy, correctly interpreting the serologic findings.
12. Identify problems in pre-analytic, analytic and post-analytic testing in immunology and blood banking and determine appropriate corrective action.
13. Explain the principle of the antiglobulin test.
14. Differentiate monospecific from polyspecific antiglobulin sera.
15. Discuss the preparation of monoclonal and polyclonal AHG reagents.
16. Differentiate between the IAT and DAT procedures and their uses.
17. Identify factors that affect the antiglobulin test.
18. Participate in a service learning project by hosting a blood drive for the UTRGV community.

CLSC 3513 IMMUNOHEMATOLOGY
Lecture Schedule

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<th>DATE</th>
<th>TOPIC</th>
<th>READING ASSIGNMENT</th>
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<tr>
<td>Oct 22</td>
<td>Intro, Antigens and Antibodies</td>
<td>Chapter 1, 3</td>
<td>Rittenhouse-Olsen</td>
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CLSC 3513 Lab Schedule

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