HORRY GEORGETOWN TECHNICAL COLLEGE

INSTRUCTIONAL PACKAGE

MLT 120
Immunohematology

Effective Term
Fall 2025/Spring 2026/Summer 2026

INSTRUCTIONAL PACKAGE

Part I: Course Information

COURSE PREFIX: MLT 120 COURSE TITLE: Immunohematology

CONTACT HOURS: 6 hours CREDIT HOURS: 4 hours.

RATIONALE FOR THE COURSE:

This course introduces the theory and practice of blood banking, including the ABO, RH and other blood group systems, compatibility testing, and HDN.

COURSE DESCRIPTION:

This course introduces the theory and practice of blood banking, including the ABO, RH and other blood group systems, compatibility testing, and HDN.

PREREQUISITES/CO-REQUISITES:

Co-Req MLT 210 and MLT 205; pre-Req MLT 102, MLT 115, MLT 131 and MLT 105.
A grade of C or higher in all previous general education courses.

REQUIRED MATERIALS:

Please visit the BOOKSTORE online site for most current textbook information.

Enter the semester, course prefix, number and section when prompted and you will be linked to the correct textbook.

ADDITIONAL REQUIREMENTS:

Lab coats and goggles are provided and required for the lab skills portion.

TECHNICAL REQUIREMENTS:

Access to Desire2Learn (D2L), HGTC's learning management system (LMS) used for course materials.
Access to myHGTC portal for student self-services.
College email access – this is the college's primary official form of communication.

CLASSROOM ETIQUETTE:

As a matter of courtesy to other students and your professor, please turn off cell phones and other communication/entertainment devices before class begins. If you are monitoring for an emergency, please notify your professor prior to class and switch cell phone ringers to vibrate.

Part II: Student Learning Outcomes

COURSE LEARNING OUTCOMES and ASSESSMENTS*:

After successful completion of this course, the student will be able to:

1. Describe Quality Assurance and Regulation of the Blood Industry and Safety Issues in the Blood Bank
2. Categorize examples of preanalytical, analytical and post analytical parts of the Immunohematology testing process.
3. Describe Immunology Basic Principles and Applications in the Blood Bank.
4. Explain the use and applications of Blood Banking Reagents
5. Differentiate Blood Group Systems and population Genetics.
6. Describe Pretransfusion Testing: Antibody Detection and Identification and Compatibility Testing
7. Explain Transfusion Therapy in Selected Patients
8. Explain Donor Selection and Phlebotomy
9. Describe Blood Component Preparation and Therapy

Week 1
Lecture: Basic & Applied Concepts of Blood Banking and Transfusion Practices
Chapter One

1. List the elements of, and explain the importance of, a well-written standard operating procedure (SOP)
2. Define and describe the purpose behind root-cause analysis in error management.
3. Properly dispose of laboratory waste material
4. Recognize the need for accident reporting.
5. Conduct testing using safety principles.

Chapter Two

1. Describe the characteristics of antigens that are located on RBCs, white blood cells, and platelets.
2. Compare and contrast immunoglobulin M (IgM) and IgG antibodies with regard to structure, function, and detection by agglutination reactions.
3. List the variables in the agglutination test that affect sensitization and lattice formation.
4. Outline the biologic effects mediated by complement proteins in the clearance of RBCs.
5. Recognize hemolysis in an agglutination reaction and explain the significance.

Lab: MLT 120 Lab Manual

1. Practice RBC cell suspensions.
2. Explain the agglutination reaction results and grading.

Week 2
No Class this week.
Lab is Online assignment.

Week 3
Lecture: Basic & Applied Concepts of Blood Banking and Transfusion Practices
Chapter Three

1. Describe the relationship of potency and specificity to blood banking reagents.
2. Compare and contrast polyclonal and monoclonal antibodies.
3. Describe the basic principles of antiglobulin testing.
4. Identify the indications for implementing DATs and IATs
5. Compare and contrast the composition and appropriate uses of polyspecific and monospecific antiglobulin reagents.
6. Discuss the role of potentiators in immunohematologic testing.
7. Describe the functions of the following potentiators in immunohematologic testing: low-ionic-strength solution, bovine serum albumin, polyethylene glycol, and proteolytic enzymes.

Lab: MLT 120 Lab Manual

1. Explain the principle of the ABO and RH(D) Testing- Tube method.
2. Practice RBC cell suspensions.
3. Discuss ABO typing reagents.

Week 4
Lecture: Basic & Applied Concepts of Blood Banking and Transfusion Practices
Chapter Four

1. Define the term blood group system with regard to genetic terms.
2. Differentiate phenotype from genotype.
3. Distinguish homozygous from heterozygous and provide an example using blood group system alleles.
4. Explain phenotype frequency and how it is used to find compatible red blood cell (RBC) units.
5. List the applications of molecular testing methods to the field of blood banking.
6. Describe the molecular techniques used to identify RBC antigens and their advantages over hemagglutination methods.

Lab: MLT 120 Lab Manual

1. Explain the principle of the Cell washing- Manual Tube method.
2. Discuss the procedure of the test performed.

Week 5

Lecture: Basic & Applied Concepts of Blood Banking and Transfusion Practices
Chapter 5

1. Define a blood group system with regard to blood group antigens and their inheritance.
2. Explain Landsteiner's rule.
3. Describe the formation of the H antigen from the gene product and its relationship to ABO antigen expression.
4. Discuss the selection of whole blood, red blood cell, and plasma products for transfusions.
5. Compare and contrast the A1 and A2 phenotypes with regard to antigen structure and serologic testing.
6. Describe the ABO blood group system antibodies with regard to immunoglobulin class, clinical significance, and in vitro serologic reactions.
7. List the technical errors that may result in an ABO discrepancy.
8. Define the acquired B antigen and B(A) phenotypes; discuss the ABO discrepancies that would result from these phenotypes and methods used in resolving these discrepancies.
9. Discuss the Bombay phenotype with regard to genetic pathway, serologic reactions, and transfusion implications.

Lab: MLT 120 Lab Manual

1. Practice Antibody Screen Testing
1. Discuss the interpretation of the results.
2. Discuss considerations for the ordering of the test.

Week 6
Lecture: Basic & Applied Concepts of Blood Banking and Transfusion Practices
Chapter 6

1. Explain how the D antigen was named Rh.
2. Describe the current genetic theory of the inheritance of Rh system antigens.
3. Compare and contrast the genetic theories behind the Fisher-Race and Wiener terminologies and translate from one to the other.
4. Compare the Rosenfield and International Society of Blood Transfusion (ISBT) terminologies with the Fisher-Race and Wiener terminologies and discuss their uses.
5. Predict the Rh genotype given a phenotype.
6. Explain the test for the weak D antigen and the importance of an appropriate control.
7. Describe the characteristics of the Rh system antibodies and their clinical significance with regard to transfusion and hemolytic disease of the fetus and newborn (HDFN)

Lab: MLT 120 Lab Manual

2. Practice Direct Antiglobulin Testing.
3. Discuss the interpretation of the results.
4. Discuss considerations for the ordering of the test.

Week 7
Lecture: Basic & Applied Concepts of Blood Banking and Transfusion Practices
Chapter 7

1. Identify the major antigens within the other blood group systems.
2. List the frequencies of the observed phenotypes and the association of phenotypes with ethnic group diversity.
3. Describe the biochemical characteristics of antigens within each blood group system.
4. Compare and contrast the serologic characteristics and clinical relevance of the antibodies associated with each blood group system.
5. Identify unique characteristics of selected blood group systems regarding disease association and biologic functions.

Lab: MLT 120 Lab Manual

1. Explain the principle of the Antibody identification test.
2. Discuss the procedure of the test performed.
3. Discuss the interpretation of the results.
4. Discuss considerations for the ordering of the test.

Week 8
Lecture: Basic & Applied Concepts of Blood Banking and Transfusion Practices
Chapter 8 – Sections 1 & 2

1. Compare and contrast the Autocontrol and direct antiglobulin test (DAT)
2. Explain why patient information regarding transfusion or pregnancy history, age, race, and diagnosis helps in the process of antibody identification.
3. Discuss how the reaction strength contributes to antibody resolution.
4. Describe the process of ruling out antibodies on a panel.
5. Describe the properties of a high-titer, low-avidity antibody, and techniques for identifying or avoiding reactivity.
6. Discuss the use of and potential problems with the prewarming procedure.
7. List methods of enhancing weak immunoglobulin G (IgG) antibodies
8. Explain the process of identifying the specificity of a cold autoantibody and techniques to avoid cold autoantibody reactivity.
9. Describe the process and limitations of adsorption techniques as they apply to warm and cold autoantibodies.
10. Define the elution procedure and list the methods and purposes of this test.

Lab: MLT 120 Lab Manual

1. Explain the principle of the Gel methodology for Immunohematology.
2. Discuss the procedure of the test performed.

3. Discuss the interpretation of the results.
4. Discuss considerations for the ordering of the test.
5. Discuss the Ortho Workstation parts and principle.

Week 9
Lecture: Basic & Applied Concepts of Blood Banking and Transfusion Practices
Chapter 13

1. Describe the required donor registration information and why it is necessary.
2. Explain the importance and discuss the content of the blood donor educational materials.
3. Analyze health history examples that could cause a permanent, indefinite, or temporary deferral.
4. Determine the eligibility status of donors when common medications and recent vaccines are part of the donor history.
5. Select eligible donors and identify donors for deferral.
6. List various forms of autologous donations.
7. Describe the apheresis procedure, the products that can be collected, and the donor requirements for each.
8. Discuss the reason for directed donation and the donor criteria for this procedure.

Chapter 14

1. List the required tests performed on allogeneic and autologous donor blood.
2. Describe the enzyme-linked immunosorbent assay (EIA), and differentiate among sandwich, indirect, and competitive EIA techniques.
3. Describe the principle of nucleic acid testing for donor blood samples.
4. Describe when cytomegalovirus (CMV) screening is performed.
5. State the frequency of positive tests on blood donated for allogeneic transfusion.
6. Define look-back investigation and the Food and Drug Administration (FDA) requirements with regard to hepatitis C virus (HCV) and human immunodeficiency virus (HIV) testing on blood donors.
7. State the reason for performing bacterial detection tests on plateletpheresis products.

Lab: Lab Practice of skills learned previously.

Week 10
Lecture: Basic & Applied Concepts of Blood Banking and Transfusion Practices
Chapter 9

1. List the procedures included in the routine compatibility test and explain their purpose.
2. Discuss the selection of crossmatch-compatible whole blood, red blood cells (RBCs), plasma, platelets, and cryoprecipitate for transfusion.
3. Discuss strategies for transfusion when compatible blood cannot be located.

4. Discuss limitations of crossmatching
5. Describe how crossmatching is handled in the massive transfusion situation.
6. Explain the elements of patient identification and their importance in compatibility testing.
7. Explain the use of a typing and screening protocol and a maximum surgical blood order schedule.
8. Explain how compatibility testing is carried out for an infant younger than 4 months of age.

Week 11
Lecture: Basic & Applied Concepts of Blood Banking and Transfusion Practices.
Chapter 10

1. Compare and contrast the forces driving the move to automation in the transfusion service.
2. Identify the potential benefits and challenges associated with a change to automation.
3. Compare and contrast gel technology and solid-phase red cell adherence (SPRCA) assays.

Lab: MLT 120 Lab Manual

1. Explain the principle of the Compatibility Testing
2. Explain the principle of the Direct Antiglobulin Testing (DAT)
3. Discuss the procedure of the tests performed.
4. Discuss the interpretation of the results.
5. Discuss considerations for the ordering of the tests.

Week 12
Lecture: Basic & Applied Concepts of Blood Banking and Transfusion Practices
Chapter 11

1. List common signs and symptoms of adverse and delayed transfusion reactions.
2. Discuss the mechanisms that can cause immune- and nonimmune-mediated red blood cell (RBC) destruction.
3. Compare and contrast the distinguishing features of the following transfusion reactions: febrile, urticarial, and anaphylactic reactions; transfusion-related acute lung injury; and transfusion-associated graft-versus-host (GVH) disease.
4. Discuss the causes and clinical features of the bacterial contamination of blood products.
5. Describe the clinical features and patients at risk for a transfusion reaction caused by circulatory overload.

Chapter 12

1. Discuss the cause of hemolytic disease of the fetus and newborn (HDFN)
2. Correlate the tests included in an initial prenatal workup with their significance in predicting HDFN.

3. Distinguish clinically significant and insignificant antibodies in terms of causing HDFN.
4. List the tests routinely performed on cord blood cells when HDFN is suspected and discuss possible sources of error when performing each test.
5. Compare and contrast the clinical and laboratory findings in ABO HDFN versus HDFN caused by anti-D antibody.
6. Discuss the composition, eligibility criteria, and principle of Rh immune globulin (RhIG)
7. Explain the principle, interpretation, and significance of a positive rosette test for fetomaternal hemorrhage.
8. Outline the principle, interpretation, and significance of Kleihaur-Betke acid elution.
9. Evaluate laboratory test results for postpartum samples and determine if RhIG should be administered.
10. Calculate the dose of RhIG, given the fetomaternal hemorrhage results.
11. Explain the selection of blood for an intrauterine exchange transfusion with regard to ABO and D phenotype.

Lab: MLT 120 Lab Manual

1. Explain the principle of the Transfusion Reaction Workup
2. Discuss the procedure of the test performed.
3. Discuss the interpretation of the results.
4. Discuss considerations for the ordering of the test.
5. Lab: MLT 120 Lab Manual
6. Practice for Lab Comprehensive Competency

Week 13
Lecture: Basic & Applied Concepts of Blood Banking and Transfusion Practices
Chapter15

1. Explain the benefits of component separation.
2. Define storage lesion and list the elements that change during blood storage.
3. Compare the anticoagulant and preservative solutions with regard to expiration and content.
4. Given certain patient clinical conditions, state the blood component most appropriate for their transfusion needs.
5. State the storage temperature and storage limits for each blood component.
6. List the labeling requirements common to all blood components and the International Society of Blood Transfusion (ISBT)128 advantages.
7. Discuss the importance of monitored storage equipment for blood components and the alarm requirements.

Lab: MLT 120 Lab Manual

1. Practice for Lab Comprehensive Evaluation.

Week 14
Lecture: Basic & Applied Concepts of Blood Banking and Transfusion Practices

Chapter 16

1. Describe the pathophysiology of acute blood loss and massive transfusion therapy.
2. Discuss the transfusion requirements and causes of bleeding during cardiac surgery.
3. Describe the unique hematologic problems and transfusion therapy issues associated with neonates.
4. Discuss the pathophysiology and transfusion needs of patients with sickle cell disease, thalassemia, and autoimmune disease.
5. Compare and contrast the various applications of therapeutic apheresis and the conditions and diseases associated with its use.
6. Discuss the transfusion issues unique to chronic renal disease patients and how the use of erythropoietin affects the need for red blood cell (RBC) transfusions.
7. List several alternatives for transfusion of blood products and their application in coagulation-deficient, trauma, and oncology patients.

Lab: MLT 120 Lab Manual

1. Lab Comprehensive Evaluation

Students – please refer to the Instructor's Course Information sheet for specific information on assessments and due dates.

Part III: Grading and Assessment

EVALUATION OF REQUIRED COURSE MEASURES/ARTIFACTS*:

Students' performance will be assessed, and the weight associated with the various measures/artifacts are listed below.

EVALUATION*

Chapter Tests		50%
Lab Assignments		20%
Lab Comprehensive evaluation	50%	
Lab skills competencies	25%	
Weekly Affective Skills	25%	
Homework Assignments		5%
In class quizzes		5%
Final Exam		20%
		100%

Students, for the specific number and type of evaluations, please refer to the Instructor's Course Information Sheet.

GRADING SYSTEM:

State the College's or departmental grading system as delineated in the Catalog. Please note the College adheres to a 10-point grading scale A = 100 – 90, B = 89- 80, C = 79 – 70, D = 69 – 60, F = 59 and below. You must have your Dean's approval if changes in the scale are made.

Grades earned in courses impact academic progression and financial aid status. Before withdrawing from a course, be sure to talk with your instructor and financial aid counselor about the implications of that course of action. Ds, Fs, Ws, WFs and Is also negatively impact academic progression and financial aid status.

The Add/Drop Period is the first 5 days of the semester for **full term** classes. Add/Drop periods are shorter for accelerated format courses. Please refer to the academic calendar for deadlines for add/drop. You must attend at least one meeting of all your classes during that period. If you do not, you will be dropped from the course(s) and your Financial Aid will be reduced accordingly.

Part IV: Attendance

Horry-Georgetown Technical College maintains a general attendance policy requiring students to be present for a minimum of 80 percent (80%) of their classes in order to receive credit for any course. Due to the varied nature of courses taught at the college, some faculty may require up to 90 percent (90%) attendance. Pursuant to 34 Code of Federal Regulations 228.22 - Return to Title IV Funds, once a student has missed over 20% of the course or has missed two (2) consecutive weeks, the faculty is obligated to withdraw the student, and a student may not be permitted to reenroll. **Instructors define absentee limits for their class at the beginning of each term; please refer to the Instructor Course Information Sheet.**

For online and hybrid courses, check your Instructor's Course Information Sheet for any required on-site meeting times. Please note, instructors may require tests to be taken at approved testing sites, and if you use a testing center other than those provided by HGTC, the center may charge a fee for its services.

Part V: Student Resources

THE STUDENT SUCCESS AND TUTORING CENTER (SSTC):

The SSTC offers to all students the following **free** resources:

1. Academic tutors for most subject areas, Writing Center support, and Academic Coaching for college success skills.
2. Online tutoring and academic support resources.
3. Professional and interpersonal communication coaching in the EPIC Labs.

Visit the Student Success & Tutoring Center website for more information. To schedule tutoring or coaching, contact the SSTC at sstc@hgtc.edu or self-schedule in the Penji iOS/Android app or at www.penjiapp.com. Email sstc@hgtc.edu or call SSTC Conway, 349-7872; SSTC Grand Strand, 477-2113; and SSTC Georgetown, 520-1455, or go to the SSTC Online Resource Center to access on-demand resources.

STUDENT INFORMATION CENTER: TECH Central

TECH Central offers to all students the following free resources:

1. Getting around HGTC: General information and guidance for enrollment, financial aid, registration, and payment plan support!

2. In-person and remote assistance are available for Desire2Learn, Student Portal, Degree Works, and Office 365.

3. Chat with our staff on TECH Talk, our live chat service. TECH Talk can be accessed on the student portal and on TECH Central's website, or by texting questions to (843) 375-8552. Visit the Tech Central website for more information. Live Chat and Center locations are posted on the website. Or please call (843) 349 – TECH (8324), Option # 1.

HGTC LIBRARY:

Each campus location has a library where HGTC students, faculty, and staff may check out materials with their HGTC ID. All three HGTC campus libraries have librarians and staff who can aid with research, computers to support academic research and related school-work, and individual/group study rooms. Printing is available as well at each location. Visit the Library website for more information or call (843) 349-5268.

STUDENT TESTING:

Testing in an **online/hybrid** course and in **make-up exam** situations may be accomplished in a variety of ways:

- Test administered within D2L.

- Test administered in writing on paper.
- Test administered through Publisher Platforms (which may have a fee associated with the usage)

Furthermore, tests may have time limits and/or require a proctor.

Testing candidates must make their appointments 24 hours in advance.

Students must bring a physical ID in order to take a test.

Proctoring can be accomplished either face-to-face at an approved site or online through our online proctoring service. To find out more about proctoring services, please visit the Online Testing section of the HGTC's Testing Center webpage.

The **Instructor Information Sheet** will have more details on test requirements for your course.

DISABILITY SERVICES:

HGTC is committed to providing an accessible environment for students with disabilities. Students seeking accommodations are encouraged to visit HGTC's Accessibility and Disability Service webpage for detailed information.

It is the student's responsibility to self-identify as needing accommodations and to provide appropriate documentation. Once documentation is submitted, the student will participate in an interactive process with Accessibility and Disability Services staff to determine reasonable accommodations. Students may begin the accommodations process at any time; however, accommodations are **not retroactive** and will only be applied from the point at which they are approved. Students must contact the office **each semester** to renew their accommodations.

For assistance, please contact the Accessibility and Disability Services team at disabilityservices@hgtc.edu or 843-796-8818 (call or text).

COUNSELING SERVICES:

HGTC Counseling Services strives to optimize student success through managing personal and academic concerns that may interfere with achieving educational goals. Staff are available to every student for assistance and guidance on personal matters, academic concerns and other areas of concern. HGTC offers free in-person and telehealth counseling services to students. For more information about counseling services, please reach out to counseling@hgtc.edu or visit the website the Counseling Services webpage.

STATEMENT OF EQUAL OPPORTUNITY/NON-DISCRIMINATION STATEMENT:

Our sincere commitment to both effective business management and equitable treatment of our employees requires that we present this Policy Statement as an embodiment of that commitment to the fullest.

Discrimination is conduct that includes unjust or prejudicial treatment based upon an individual's sex, race/color, religion, national origin, age, disability, service in the uniformed services (as defined in state and federal law), veteran status, political ideas, marital or family status, pregnancy, childbirth, or related medical conditions, including, but not limited to, lactation, genetic information, genetic identity, gender expression, or sexual orientation that excludes an individual from participation in, denies the individual the benefits of, treats the individual differently, or otherwise adversely affects a term or condition of a person's working or learning environment. This includes failing to provide reasonable accommodation, consistent with state and federal law, to persons with disabilities.

INQUIRIES REGARDING THE NON-DISCRIMINATION/TITLE IX POLICIES:

Student and prospective student inquiries concerning Section 504, Title II, Title VII, and Title IX and their application to the College or any student decision may be directed to the Vice President for Student Affairs.

Dr. Melissa Batten, VP Student Affairs
Title IX, Section 504, and Title II Coordinator
Building 1100, Room 107A, Conway Campus
PO Box 261966, Conway, SC 29528-6066
843-349-5228
Melissa.Batten@hgtc.edu

Employee and applicant inquiries concerning Section 504, Title II, and Title IX and their application to the College may be directed to the Vice President for Human Resources.

Jacquelyne Snyder, VP Human Resources
Affirmative Action/Equal Opportunity Officer and Title IX Coordinator
Building 200, Room 205B, Conway Campus
PO Box 261966, Conway, SC 29528-6066
843-349-5212
Jacquelyne.Snyder@hgtc.edu

TITLE IX REQUIREMENTS:

Title IX of the Education Amendments of 1972 protects students, employees, applicants for admission and employment, and other persons from all forms of sex discrimination.

HGTC prohibits the offenses of domestic violence, dating violence, sexual assault, and stalking and will provide students, faculty, and staff with necessary information regarding prevention, policies, procedures, and resources.

Any student, or other member of the college community, who believes that they have been a victim of sexual harassment, domestic violence, dating violence, sexual assault, or stalking may file a report with the college's Title IX Coordinator or campus law enforcement*.

> *Faculty and Staff are required to report these incidents to the Title IX Coordinator when involving students. The only HGTC employees exempt from mandatory reporting are licensed mental health professionals (only as part of their job description such as counseling services).

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PREGNANCY ACCOMMODATIONS

Under Title IX, colleges must not exclude a pregnant student from participating in any part of an educational program. Horry-Georgetown Technical College is committed to ensuring that pregnant students receive reasonable accommodations to ensure access to our educational programs.

Students should advise the Title IX Coordinator of a potential need for accommodations as soon as they know they are pregnant. It is extremely important that communication between student, instructors, and the Title IX Coordinator begin as soon as possible. Each situation is unique and will be addressed individually.

Title IX accommodations DO NOT apply to Financial Aid. Financial Aid regulations do not give the College any discretion in terms of Financial Aid eligibility.

Certain educational programs may have strict certification requirements or requirements mandated by outside regulatory agencies. Therefore, in some programs, the application of Title IX accommodations may be limited.

To request pregnancy accommodations, please complete the *Pregnancy Intake Form* that can be found here.