

# Virginia Western Community College

## MDL 126

### Clinical Immunohematology / Immunology I

#### Prerequisites

N/A

#### Course Description

Incorporates basic principles of antigen and antibody reactions included in blood grouping and typing, compatibility testing, and serological procedure.

**Semester Credits: 4**

**Lecture Hours: 2**

**Lab/Clinical/Internship Hours: 6**

#### **Required Materials:**

Textbook:

Modern Blood Banking & Transfusion Practice, 7th Edition by Denise M. Harmening, Davis Plus, 2012.  
ISBN: 9780803668881

#### **Course Outcomes:**

**At the completion of this course, the student should be able to:**

- Identify an atypical antibody or antibodies in an unknown sample
- List and state the significance of the secondary human blood groups
- Distinguish between warm and cold or clinically significant and insignificant antibodies
- Perform quality assurance as related to blood bank reagents and equipment
- Perform routine blood bank tests to include: ABO/Rh, Antibody Detection, Antibody Identification, Direct Antiglobulin Test, Prenatal Antibody Titration
- Identify, prepare, and store blood products using proper product storage requirements, appropriate product selection, means of transfusion and special handling requirements
- Perform calculations relating to blood bank processes to include: RhIg dosage, total blood volume, corrected platelet count increment (CCI)
- Recognize and troubleshoot unusual test results
- Perform advanced testing concepts and techniques utilized in the blood bank or reference laboratory setting
- Recognize how pre-analytical, analytical, and post analytical errors can adversely affect results

## Topics

### 1. Laboratory Safety

- General Safety Principals
- Blood-Borne Pathogen Safety
- Chemical Safety
- Radiation Safety
- Protection from Physical Hazards

### 2. Fundamental Concepts

- Red Blood Cell and Platelet Preservation: Historical Perspectives and Current Trends

### 3. Overview of the Routine Blood Bank Laboratory

- Organization
- Personnel Requirements
- Standard Operating Procedures
- Transfusion Process Oversight

### 4. Quality and Compliance Issues

- Quality Management
- Equipment Preventative Maintenance/Quality Control, qualification/ validation
- Supply and Reagent receipt, inspection, acceptance testing, QC
- Nonconformance

### 5. Fundamental Concepts

- Basic Genetics / Blood Group Genetics
- Fundamentals of Immunology
- Concepts in Molecular Biology

### 6. Blood Bank Testing Methodologies Overview

- Test tube – reagents, enhancement medias
- Automated methods – Gel, Solid Phase, other
- Overview Advanced Methods –adsorption/ elution, inhibition, chemical treatments

### 7. Blood Groups and Serologic Testing

- The Antiglobulin Test
- The ABO Blood Group System
- The Rh Blood Group System
- Blood Group terminology and Other Blood Groups

### 8. Review of Safety and Quality Management

### 9. Review of MDL 126

- ABO/Rh theory, principles and testing procedures
- DAT theory, principles and testing procedures

### 10. Blood Collection

- Donor selection and qualification - health history questions, physical exam

- Collection type-
- Whole blood veinipuncture
- Apheresis - blood, platelet, plasma
- Special Collections: Autologous, Homologous, and Directed
- Collection Processes

### **11. Blood Components**

- Component Production
- Blood Component testing / labeling
- Product Requirements and QC
- Product Storage and Distribution

### **12. Antibody Detection and Identification**

- Low incidence antigens
- High incidence antigens
- Antibody Identification
  - Requirements to rule out specificities
  - Requirements to confirm antibody identification
  - Probability (P-value)
- Positive DAT

### **13. Transfusion Practices -**

- Pre-transfusion Testing
- Post-Transfusion Testing/ Transfusion Reactions/ Testing for Investigation of transfusion reactions

### **14. Blood Group Systems - Characteristics of antigen/ antibody and special testing for antibody identification (if applicable)**

- Lewis /H/I Systems
- Kell System
- Kidd System
- Duffy System
- MNS System
- P System
- Other Blood Group Systems

### **15. Advanced Antibody Identification Techniques**

- Adsorption/ Elution
- Chemical Treatments
- Inhibition

#### **Notes to Instructors:**

MDL 227 continues from the point that MDL 126 ends. Topics 1-7 are usually covered in MDL126 and topics 8-15 in MDL 227.