

Virginia Western Community College

MDL 227

Immunohematology / Immunology II

Prerequisites

Successful completion of MDL 126.

Course Description

Emphasizes ability to apply theories and procedures utilized in immunohematology for routine transfusion and donor services. Correlates theories with practical application in order to assess cellular and immune mechanisms in specific disease states

The course is designed to continue instruction for MLT students in immunohematology after having completed the prerequisite course. Instruction will include review of immunology and genetics relating to blood bank, requirements for blood donation and component production, quality control, routine blood bank testing, equipment qualification, use and maintenance, pre-transfusion procedures, red cell antibody identification, transfusion practices and discussion of advanced blood bank theories and techniques. At completion the MLT students should be able to perform routine testing in a blood bank setting.

Semester Credits: 7

Lecture Hours: 1

Lab/Clinical/Internship Hours: 6

Required Materials

Textbook:

Modern Blood Banking & Transfusion Practice. 6th Edition. Denise M. Harmening. Davis Plus, 2012.
ISBN: 9780803626829

Supplementary Materials:

Course Outcomes

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

- Understand basic blood bank concepts, terms and procedures
- Understand 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
- Understand blood products, product storage requirements, appropriate product selection, means of transfusion and special handling requirements
- Perform calculations relating to blood bank processes to include: Rhlg dosage, total blood volume, corrected platelet count increment (CCI)

- Recognize and troubleshoot unusual test results
- Be familiar with advanced testing concepts and techniques utilized in the blood bank or reference laboratory setting

Topical Description

**NOTE: Sections I-VII are covered in the first semester course – MDL 126
Immunohematology/Immunology I**

Section I: Laboratory Safety

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

Section II: Fundamental Concepts (Part I)

- Red Blood Cell and Platelet Preservation: Historical Perspectives and Current Trends (Ch 1)

Section III: Overview of the Routine Blood Bank Laboratory (Part I – Ch 11)

- Organization
- Personnel Requirements
- Standard Operating procedures
- Transfusion process Oversight

Section IV: Quality and Compliance Issues (Part V – Ch 23)

- Quality Management
- Equipment Preventative Maintenance/Quality Control, Qualification/Validation
- Supply and Reagent Receipt, Inspection, Acceptance Testing, Quality Control
- Nonconformance's

Unit V: Fundamental Concepts (Part I)

- Basic Genetics / Blood Group Genetics (Ch 2)
- Fundamentals of Immunology (Ch 3)
- Concepts in Molecular Biology (Ch 4)

Unit VI: Blood Bank Testing Methodologies Overview (Part II Chapters 5 & 12)

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

Unit VII: Blood Groups and Serologic Testing (Part II)

- The Antiglobulin Test (Ch 5)
- The ABO Blood Group System (Ch 6)
- The Rh Blood Group System (Ch 7)
- Blood Group terminology and Other Blood Groups (Ch 8)

NOTE: Sections VIII-XIII are covered in the second semester course – MDL 227

Unit VIII: Blood Collection (Part III – Chapters 13 & 14)

- Donor selection and qualification – health history questions, physical exam
- Collection type
- Collection Processes

Unit IX: Blood Components (Part III – Chapters 13 & 14)

- Component Production
- Blood Component Testing / Labeling
- Product Requirements and Quality Control
- Product Storage and Distribution

Unit X: Antibody Detection and Identification (Part II – Ch 9)

- Low Incidence Antigens
- High Incidence Antigens
- Antibody Identification
- Positive DAT

Unit XI: Transfusion Practices

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

Unit XII: 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

Unit XIII: Advanced Techniques

- Adsorption / Elution
- Chemical Treatments
- Inhibition

Note to Instructors