

MDL 227

Immunoematology / Immunology II

COURSE OUTLINE

Prerequisites:

MDL 126 Clinical Immunoematology / Immunology I

Course Description:

Emphasizes ability to apply theories and procedures utilized in immunoematology for routine transfusion and donor services. Correlates theories with practical application in order to assess cellular and immune mechanisms in specific disease states. Lecture 1 hour. Laboratory 6 hours. Total 7 hours per week.

The course is designed to continue instruction for MLT students in immunoematology 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: 3 Lecture Hours: 1 Lab/Recitation Hours: 6

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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: RhIg 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

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Required Materials:

Textbook:

Modern Blood Banking & Transfusion Practice, Sixth Edition by Denise M. Harmening
Davis Plus, 2012.

ISBN:978-0-8036-2682-9

The following supplementary materials are available:

- 1.
- 2.
- 3.

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Topical Description: (Outline chapters and sections to be covered in the book – may include timeline)

Topic Description:

Topics:

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

- I. Laboratory Safety
 - A. General Safety Principals
 - B. Blood-Borne Pathogen Safety
 - C. Chemical Safety
 - D. Radiation Safety
 - E. Protection from Physical Hazards

- II. Fundamental Concepts (Part I)
 - A. Red Blood Cell and Platelet Preservation: Historical Perspectives and Current Trends (Chapter 1)

- III. Overview of the Routine Blood Bank Laboratory (Part II – Chapter 11)
 - A. Organization
 - B. Personnel Requirements
 - C. Standard Operating Procedures
 - D. Transfusion Process Oversight

- IV. Quality and Compliance Issues (Part V - Chapter 23)
 - A. Quality Management
 - B. Equipment Preventative Maintenance/Quality Control, qualification/ validation
 - C. Supply and Reagent receipt, inspection, acceptance testing, QC
 - D. Nonconformances

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- V. Fundamental Concepts (Part I)
 - A. Basic Genetics / Blood Group Genetics (Chapter 2)
 - B. Fundamentals of Immunology (Chapter 3)
 - C. Concepts in Molecular Biology (Chapter 4)

- VI. Blood Bank Testing Methodologies Overview (Part II- Chapter 5 and Chapter 12)
 - A. Test tube – reagents, enhancement medias
 - B. Automated methods – Gel, Solid Phase, other
 - C. Overview Advanced Methods –adsorption/ elution, inhibition, chemical treatments

- VII. Blood Groups and Serologic Testing (Part II)
 - A. The Antiglobulin Test (Chapter 5)
 - B. The ABO Blood Group System (Chapter 6)
 - C. The Rh Blood Group System (Chapter 7)
 - D. Blood Group terminology and Other Blood Groups (Chapter 8)

Note: Sections VIII - XIII are covered in the second semester course – MDL 227 Immunoematology / Immunology II

- VIII. Blood Collection (Part III – Chapters 13-14)
 - A. Donor selection and qualification – health history questions, physical exam
 - B. Collection type-
 - i. Whole blood veinipuncture
 - ii. Apheresis – blood, platelet, plasma
 - iii. Special Collections: Autologous, Homologous, and Directed
 - C. Collection Processes

- IX. Blood Components (Part III – Chapters 13-14)
 - A. Component Production
 - B. Blood Component testing / labeling
 - C. Product Requirements and QC
 - D. Product Storage and Distribution

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- X. Antibody Detection and Identification (Part II -Chapter 9)
 - A. Low incidence antigens
 - B. High incidence antigens
 - C. Antibody Identification
 - i. Requirments to rule out specificities
 - ii. Requierments to confirm antibody identification
 - iii. Probability (P-value)
 - D. Positive DAT

- XI. Transfusion Practices –
 - A. Pre-transfusion Testing
 - B. Post-Transfusion Testing/ Transfusion Reactions/ Testing for Investigation of transfusion reactions

- XII. Blood Group Systems – Characteristics of antigen/ antibody and special testing for antibody identification (if applicable)
 - A. Lewis /H/I Systems
 - B. Kell System
 - C. Kidd System
 - D. Duffy System
 - E. MNS System
 - F. P System
 - G. Other Blood Group Systems

- XIII. Advanced Techniques
 - A. Adsorption/ Elution
 - B. Chemical Treatments
 - C. Inhibition

