

American University of Beirut
Faculty of Health Sciences
Medical Laboratory Sciences Program
LABM 270 (Blood Banking)
Spring AY 23-24

Lecturer

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Course Description

This course is part of a clinical laboratory rotation designed for medical laboratory technology students. It will develop the theory and practice needed to perform basic techniques for ABO grouping, Rh grouping and the antiglobulin tests. It will provide the theory on other group systems and skills and procedures needed to identify related antigens and antibodies. In addition this course will describe the procedure to identify and resolve ABO discrepancies and prevent hemolytic diseases in newborns.

This course will provide hands on experience in a modern hospital transfusion service laboratory, along with weekly tutorials, followed by comprehensive theoretical, oral and practical examinations.

General Instructional Objectives

This course on Blood Banking is designed to allow students to:

- 1- link acquired and new theoretical knowledge and principles on blood banking to applied testing procedures in blood bank settings
- 2- review challenges in blood bank routine procedures

- 3- learn about potential methods to solve observed discrepancies
- 4- Acquire the knowledge and skills to diagnose and prevent hemolytic diseases

Specific Learning Outcomes

Upon completion of this course, students should be able to:

1. perform basic techniques to detect and identify ABO antigens and antibodies
2. recognize related subgroups
3. recognize and resolve observed discrepancies
4. perform basic techniques to identify Rh antigens and antibodies
5. identify other blood group systems
6. detect hemolytic diseases in newborns and hemolytic anemia due to autoimmune diseases
7. understand different quality control measures done on machines, reagents and blood components

Course Content

<u>Week</u>	<u>Topics</u>	<u>Laboratory Activities under Supervision</u>
Week 1	ABO blood group system Subgroups of A Subgroups of B	Introduction to the Blood Center (Donors Room/Blood Bank) Safety in the lab Donor selection (questionnaire, physical exam and blood collection) Requisitions and Samples
Week 2	ABO discrepancies: Forward and Reverse Exercises and clinical cases: Identifying potential causes of ABO discrepancies ABO discrepancies homework	ABO/Rh(D) typing Variation of the Rh(D) antigen (Du Ag or Weak D) Resolution of ABO discrepancies - Perform both direct and indirect antihuman globulin tests

		<p>-Describe the preparation method and storage criteria of different blood components</p> <p>-Describe the criteria for blood unit rejection depending on the viral screening results</p> <p>-Select blood donors based on the criteria set in the section</p>
Week 3	<p>Homework correction</p> <p>Potential resolution techniques to solve discrepancies</p> <p>Rh blood group system and weak D</p> <p>Other major blood group systems (Kell, Duffy, Kidd, Lewis, P, MNS, Lutheran)</p> <p>technical protocols (Elution/Adsorption, Direct and Indirect Anti-globulin Tests)</p>	<p>Component administration (preparation and preservation)</p> <p>DAT Polyspecific</p> <p>Antibody screening test</p> <p>Antibody identification test*</p> <p>Compatibility testing (Immediate spin/Major cross match)</p> <p>Quality control (reagent, instruments, and records)</p> <p>Neonatal testing Immune anti-A and anti-B</p>
Week 4	<p>Immune Hemolytic Anemia</p> <p>HDN</p> <p>Cord blood testing</p> <p>Homework: Research paper preparation on West Nile Virus or Zika virus</p>	<p>- Read different panel results</p> <p>- Check the different machines found in the blood bank section</p> <p>- Perform the major cross match test</p>

		Irradiation & Filtration of blood component Extensive and selective Phenotyping
Week 5	Screening/ Prevention of diseases transmitted through blood transfusion Paper discussion on West Nile Virus/Zika virus Homework: analyzing of the National Program of COVID-19 convalescent plasma collection and transfusion guidance	- Perform supplementary practice for the practical exam Aphaeresis (plateletpheresis/ Therapeutic) Gel test & tube test techniques
Week 6	Hemapheresis/Apheresis procedures Discussion of the National Program of COVID-19 convalescent plasma collection and transfusion guidance	-Observe Blood Bank filtration of a blood unit -Observe plateletpheresis

Evaluation

Each student's final grade will be a composite of:

	%	Meets objectives
Lab assessment and practical exam	40 %	1-7
Lectures and training related written exam	40%	1-6
Attendance and Participations	10 %	1-6
Homework /quiz	10%	1-6

Reference and Books

- 1- Harmening Denise, Modern Blood Banking and Transfusion Practices, 7th ed. Philadelphia: F.A. Davis. 2019.
- 2- Blood Bank SOP and laboratory manual.
- 3- Student Handouts

Course Policy

1- Prerequisite: Students registering in this course should be familiar with basic principles of Immunology and Blood Banking (MLSP 207) and Diagnostic Serology (MLSP 259).

2- Attendance: -This practicum course requires 80 contact hours in the Blood bank section at the American University Hospital. The student is responsible for arranging to make up for the missing work. Excused absences may be given if the student provides valid reasons to explain their absence.

- Attendance will be taken during each session. In case of absence, the student is held responsible for the material missed and for any work or announcement made. Students who miss more than one-fifth of class sessions can be dropped from the course (AUB catalogue; page 56).

4- Exams: Students must take exams on set dates. Make-up exams will be given only in case of emergencies or major illness. Only Authorized medical reports will be accepted.

5- Dress Code: Students will be expected to follow a dress code at the laboratory that follows the safety measures.

6- Academic Integrity: Cheating and plagiarism will not be tolerated. Review the student Code of Conduct in your handbook and familiarize yourself with definitions and penalties. If you are in doubt about what constitutes plagiarism, ask your instructor because it is your responsibility to know. The American University of Beirut has a strict anti-cheating policy. Penalties include failing marks on the assignment in question, suspension or expulsion from University and a permanent mention of the disciplinary action in student's records.

7- Students with Disabilities: "AUB strives to make learning experiences as accessible as possible. If you anticipate or experience academic barriers due to a disability (including mental health, chronic or temporary medical conditions), please inform me immediately so that we can privately discuss options. In order to help establish reasonable accommodations and facilitate a smooth accommodations process, you are encouraged to contact the Accessible Education Office: accessibility@aub.edu.lb; +961-1-350000, x3246; West Hall, 314".