

*American University of Beirut*  
Faculty of Health Sciences  
Medical Laboratory Sciences Program  
LABM 260 (Serology)  
Spring AY/23-24

**Lecturer**

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**Coordinator**

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**Technologist in charge**

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**Course Description**

This course is part of a clinical laboratory rotation for medical laboratory technology students. The students will be exposed to the different serodiagnostic tests used for the diagnosis of infectious and autoimmune diseases. However they will not be able to perform or see all the available tests. In addition to this, students should learn about the usefulness, limitation and interfering factors for the different serological applications and relate them to the clinical condition of the patient.

**Specific Learning Outcomes**

Students should be able to:

- 1- understand the concept of different manual and serological techniques and rapid tests
- 2- perform routine serological tests available for clinical microbiology and diagnosis of infectious diseases
- 3- become familiar with tests available for the diagnosis of autoimmune diseases, allergies and hormone identification

3- understand the usefulness, limitation and interfering factors for the different serological applications

4- interpret the results obtained by relating them to the clinical condition of the patient

5- describe the principle of the automated machines that are available in the serology section.

## **Course Content**

<b><u>Week</u></b>	<b><u>Topics</u></b>	<b><u>Laboratory Activities</u></b>
<b>Week 1</b>	<p>Agglutination tests: Direct type (slides, Microtiter plates and tubes), Passive type, Reverse type</p> <p>Applications: Brucella/Rose Bengal, Salmonella/Widal, Syphilis (VDRL and RPR)</p>	<p>Lab safety</p> <p>Quality control</p> <p>Perform latex agglutination and immuno-chromatography testing</p>
<b>Week 2</b>	<p>Hemagglutination assay and types: Direct, Indirect, Inhibition, Reverse passive</p> <p>Applications: Mycoplasma pneumonia (cold agglutination test), H1N1, <i>Leishmania donovani</i>, Syphilis (TPHA)</p> <p>Clinical cases: Syphilis and Mycoplasma</p> <p>Immunodiffusion techniques : reading of test results.</p>	<p>MONOSPOT Slide Agglutination</p> <p>TPHA IHA</p> <p>Do indirect and direct hemagglutination test</p> <p>RPR (VDRL)</p> <p>BRUCELLA Tube Agglutination</p> <p>BRUCELLA CAPT</p>
<b>Week 3</b>	<p>Lateral Flow Immunochromatography assay (test components, Sandwich type and competitive type)</p> <p>Application: Helicobacter pylori. HCG, malaria,...</p>	<p><i>H. PYLORI</i> Chromatography</p> <p>COVID-19 IgG/IgM Rapid Test (Lateral Flow Chromatography)</p>

<p><b>Week 4</b></p>	<p>ELISA techniques and types</p> <p>Applications: HCG pregnancy test, Hepatitis viruses (HAV, HBV, HCV, HEV and HDV) and Herpes viruses (HSV1 &amp;2; EBV and CMV)</p> <p>Homework: Clinical cases-Hepatitis A and B</p>	<p>Distinguish between the different ELISA techniques</p> <p>MANUAL ELISA</p> <p>Perform both the direct and indirect florescent techniques</p> <p>Mycoplasma IgM</p>
<p><b>Week 5</b></p>	<p>Autoimmune diseases biomarkers</p> <p>Autoimmune Clinical cases discussion: Focus on Systemic Lupus Erythematosus and Rheumatoid arthritis</p>	<p>Check the mini VIDAS and allergy UniCAP machine found in the serology section</p> <p>Architect i2000 Tests CMIA</p>
<p><b>Week 6</b></p>	<p>Labeled immunoassays:</p> <p>RadiImmunoAssay (RIA), Enzyme-Linked Immunosorbent Assay (ELISA), Fluorescence Polarization Immuno Assay (FPIA), Chemiluminescence enzyme immunoassay (CLIA)</p> <p>Applications in Hormone or Allergy assays</p>	<p>-</p> <p>Endomysial IgA (EMA) IFA</p> <p>ANA IFA</p> <p>VIDAS Tests ELFA</p> <p>ALEGRIA Tests ELISA</p> <p>Phadia 250 Allergy machine FEIA</p>

## EVALUATION

	%	Meets objectives
Lab assessment and practical exam	40 %	1-6
Lectures related written exam + training related written exam	40%	1, 3, 4, 5 and 6
Attendance and Participations	10 %	1-6
Homework /quiz	10%	1, 3, 4 and 5

## References and Books

- 1- Clinical Immunology and Serology: A Laboratory perspective  
Christine Dorresteyn Stevens and Linda E. Miller., Fourth edition. |  
Philadelphia : F.A. Davis Company, [2017]
- 2- Immunology and serology in Laboratory Medicine, Mary Louise Turgeon,  
Seventh Edition. Elsevier (Mosby), [2022]

## Course Policy

**1-Attendance:** -This practicum course requires 80 contact hours in the Serology 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).

**2-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.

**3-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.

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](mailto:accessibility@aub.edu.lb); +961-1-350000, x3246; West Hall, 314