

American University of Beirut
Faculty of Health Sciences
MEDICAL LABORATORY SCIENCES PROGRAM
Clinical Chemistry and Endocrinology
LABM 220 (4 cr.)
Spring 2023-2024

Lecturer:	Mirna Bou Hamdan, MS, PhD Faculty of Health Sciences 319 Van Dyck
Course Coordinator and Director of Clinical Chemistry Section:	Rose Daher, PhD , Professor of Clinical Specialty Department of Pathology and Laboratory Medicine AUB-Medical Center (Facing E320, 3rd floor)
Lab Training Supervisor:	Rima EL Hajj
Clinical Rotation time (AUBMC):	MTW 8:00 am - 12:00 pm
Manual Training at FHS:	R-F 8:00 am -11:00 am, room 403
Office Hours :	By appointment via email
E-mail :	rd02@aub.edu.lb ; mb154@aub.edu.lb

Course Description and Objectives:

Students will be introduced to diagnostic procedures used in Clinical Chemistry laboratory aligned with the didactic lectures offered during junior year. The practical training is structured into two components: manual procedures conducted at the FHS laboratory and hands-on experience in a fully automated Clinical Chemistry laboratory at AUBMC, covering all phases of the workflow (pre-analytical, analytical, and post analytical phases). Throughout this period, students will be organized into two groups, each lasting for 3 weeks. At the culmination of the practical training, there will be a joint session for both groups. During this session, students will showcase their understanding through PowerPoint presentations and relevant case studies will be presented and discussed by course coordinator. This approach ensures a comprehensive review of the experiments conducted during the clinical training and utilization of the results for patients' diagnosis and management.

Specific Outcomes:

Following completion of the course, students are expected to be able to:

1. Know the principles and applications of spectrophotometry, centrifugation, pipetting and use of balances.
2. Prepare various reagents needed to perform the manual diagnostic tests.
3. Use colorimetric methods for the analysis of glucose, protein, creatinine, urea, bilirubin, lipid, calcium and uric acid in serum.
4. Apply quality check to the results achieved for accuracy, precision, reportable range.
5. Compare the concentration levels of various parameters in patients' sera to normal ranges.

6. Link abnormal concentration levels of various parameters to corresponding diseases (hyper- and hypo-states).
7. Acquire practical knowledge related to specimen/test management, reagent handling, instrument maintenance, troubleshooting and calibration, and quality control.

Practical Training Schedule

1. Clinical Chemistry lab at AUBMC (Monday, Tuesday, and Wednesday)

Session	Topic (Ms. Rima El Hajj)
Week 1	<ul style="list-style-type: none"> - Scope of service and laboratory safety - Water quality (Dr. Asma Bazzi) - Lab practice
Week 2	<ul style="list-style-type: none"> - Calibration and controls - Lab practice
Week 3	<ul style="list-style-type: none"> - Maintenance and reagents - Specimen / test result management - Lab practice

2. FHS Lab (Thursday and Friday)

Group I (January 18-February 29, 2024)			
Week	Subgroup I	Subgroup II	Topic (Dr. Mirna Bou Hamdan)
Week 1	01/18/24	02/08/24	<ul style="list-style-type: none"> - Introduction - Lab Safety - Principle and Usage of Spectrophotometry - Pipetting, centrifugation and balances - Preparation of reagents
	01/19/24	02/09/24*	<ul style="list-style-type: none"> - Colorimetric Techniques: total protein and albumin concentrations in sera
Week 2	01/25/24	02/15/24	<ul style="list-style-type: none"> - Colorimetric Techniques: glucose and BUN concentrations in serum
	01/26/24	02/16/24	<ul style="list-style-type: none"> - Colorimetric Techniques: creatinine and uric acid concentrations in serum
Week 3	02/01/24	02/22/24	<ul style="list-style-type: none"> - Colorimetric Techniques: Calcium and cholesterol concentrations in serum
	02/02/24	02/23/24	<ul style="list-style-type: none"> - Colorimetric Techniques: bilirubin (total and direct) concentrations in serum
Week 4	TBD**	TBD**	<ul style="list-style-type: none"> - Case studies: Discussion (Dr. Daher)

			- PowerPoint Presentations (Students) (Drs. Daher and Bou Hamdan)
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***The session of February 9, 2024 will given to group 2 on Thursday, February 29, 2024.**

****This session is common for both subgroups.**

Group II (March 8-April 16, 2024)			
Week	Subgroup I	Subgroup II	Topic (Dr. Mirna Bou Hamdan)
Week 1	03/08/24	04/04/24	<ul style="list-style-type: none"> - Introduction - Lab Safety - Principle and Usage of Spectrophotometry - Pipetting, centrifugation and balances - Preparation of reagents
	03/14/24	04/05/24	- Colorimetric Techniques: total protein and albumin concentrations in sera
Week 2	03/15/24	04/18/24	- Colorimetric Techniques: glucose and BUN concentrations in serum
	03/21/24	04/19/24	- Colorimetric Techniques: creatinine and uric acid concentrations in serum
Week 3	03/22/24	04/25/24	- Colorimetric Techniques: Calcium and cholesterol concentrations in serum
	03/28/24	04/26/24	- Colorimetric Techniques: bilirubin (total and direct) concentrations in serum
Week 4	TBD*	TBD*	<ul style="list-style-type: none"> - Case studies: Discussion (Dr. Daher) - PowerPoint Presentations (Students) (Drs. Daher and Bou Hamdan)

***This session is common for both subgroups.**

Assignments During Rotation

Students will be asked to prepare PowerPoint presentations of Clinical Chemistry topics assigned by the course's coordinator on current topics of clinical chemistry. The list of topics will be shared at the beginning of rotation.

Recommended References / Books

Clinical Chemistry: Techniques, Principles, Correlations. Ninth Edition. Bishop, Fody, Siclen, Mistler, Moy. Jones & Bartlett Learning. ISBN 978-1-2842-3886-0, 2023.

Any other clinical chemistry book available in the Library like: Teitz, Kaplan, Bishop.

Medical Laboratory Practicum Handbook for Senior MLS students; PLM Department – AUBMC; September 2023.

Student Evaluation		Meets Objectives
Practical Evaluation & Assignments (FHS)	20%	LOs 1-6
Practical Evaluation & Assignments (AUBMC)	20%	LOs 1-7
Students' Presentations	10%	LOs 1-6
Written Exam	50%	LOs 1-7

Course Requirements

1. **Attendance:** Attendance will be taken during each session. You are urged to attend all classes. In case of absence, you will be responsible of the material missed and for any announcements made. Students who miss more than one-fifth of class sessions and/or training without justification are subject to withdrawing from the course with a W-grade (AUB catalogue and MLS guidelines).
2. **Exams:** You are urged to take exams on the assigned time. Make up exams will be given **only** in case of emergencies or major illness (**authorized medical reports are required**). The final exam will follow AUB scheduling.
3. **Cheating and Plagiarism:** 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're 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 the student's records.
4. **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, ext 3246; West Hall, 314".
5. **Non-Discrimination – Title IX – AUB:** In line with its commitment to the principle of equal opportunity in education and employment, AUB policies protect you from discrimination on the basis of protected characteristics, including discriminatory harassment and sexual harassment. The University's non-discrimination policy applies to, and protects, all students, faculty, and staff. If you think you have experienced discrimination, discriminatory harassment, or sexual harassment, we encourage you to inform the Equity/Title IX Coordinator, Ms. Mitra Taub at 01-350000 ext. 2514, titleix@aub.edu.lb, report to a Title IX deputy at your faculty or at any other faculty (www.aub.edu.lb/titleix), or report online (www.aub.ethicspoint.com). Reports may be submitted anonymously or not.