

American University of Beirut
Faculty of Health Sciences
Systematic Bacteriology
MLSP 204 (4 credits)
Spring Semester (AY 2023/2024)

Lecturer: Dr. Mirna Bou Hamdan

Van Dyck Rm 319

Office Hours: T 2:00-4:00 p.m. or by appointment

Email: mb154@aub.edu.lb

Time and Place: Course Lecture: MRF 11:00-11:50 am, VD Auditorium
Lab Lecture: M 10:00-10:50 am, VD Auditorium
Lab Section 1: T 10:00-12:00 pm, VD 403
W 8:00-10:00 am, VD 403
R 12:00-12:30 pm, VD 403
Lab Section 2: T 12:00-2:00 pm, VD 403
W 10:00-12:00 pm, VD 403
R 12:30-1:00 pm, VD 403

Course Description

This course is designed to introduce students to the medically important bacteria, the disease they cause, clinical signs and symptoms of each disease and the laboratory diagnosis including isolation and biochemical characteristics. This course is divided into 3 didactic lectures, 1 lab lecture and 3 lab sessions per week.

Course Learning Outcomes (LOs)

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

1. Identify the biological samples needed to isolate medically important bacteria.
2. Compare the causative agents, the mode of transmission and clinical signs and symptoms of the various bacterial species.
3. Process various laboratory samples needed for bacterial identification.
4. Perform Antimicrobial susceptibility and antimicrobial resistance testing.
5. Perform the different biochemical tests used in bacterial identification.
6. Understand the measures to be taken for bacterial prevention and control.

Course Material and Readings

Suggested Reference Books:

1. Diagnostic Microbiology; Bailey and Scott's; 15th Ed (2021).

The course material will include lecture handouts and reading assignments. The lecture handouts and PowerPoint presentations will be posted on Moodle prior to class.

Course Format

Information will be delivered to students in the form of in class sessions. Course material will be offered in the form of PowerPoint presentations and handouts; the latter will be posted on Moodle prior to class in addition to assigned readings from reference books. Students are required to cover the readings prior to class for efficient participation. Quizzes on the covered material will be conducted to evaluate students.

Student Evaluation

Quiz I	15%	LOs 1, 2, 3
Quiz II	15%	LOs 1, 2, 3
Final Exam	35%	LOs 1-6
Laboratory	30%	LOs 1-6
Attendance & Participation	5%	

*Failing grade (below 60) requires a student to repeat the MLSP 204 course.

Course Outline

Week	Lecture	Topic/ Activity	Required Readings
Week 1 1/18/2024	Lecture 1	Gram-Positive Bacilli Non-branching, catalase-positive gram-positive bacilli (<i>Bacillus spp.</i> , <i>Listeria monocytogenes</i> , and <i>Corynebacterium spp.</i>)	Chapter 15: <i>Bacillus</i> and Similar Organisms. Chapter 16: <i>Listeria</i> , <i>Corynebacterium</i> , and Similar Organisms.
Week 2 1/22/2024	Lecture 2	Gram-Positive Bacilli Non-branching, catalase-negative gram-positive bacilli (<i>Erysipelothrix rhusiopathiae</i> , <i>Lactobacillus spp.</i> , <i>Gardnerella vaginalis</i>) Branching or partially acid-fast Gram-positive bacilli (<i>Nocardia spp.</i> , <i>Streptomyces spp.</i> , <i>Rhodococcus spp.</i>)	Chapter 17: <i>Erysipelothrix</i> , <i>Lactobacillus</i> , and Similar Organisms Chapter 18: <i>Nocardia</i> , <i>Streptomyces</i> , <i>Rhodococcus</i> , and Similar Organisms.

<p>Week 3 1/29/2024</p>	<p>Lecture 3</p>	<p>Gram Negative Bacilli: <i>Enterobacteriaceae</i> spp.</p> <p>(<i>Escherichia coli</i>, <i>Salmonella</i> spp., <i>Shigella</i> spp., <i>Klebsiella</i> spp., <i>Citrobacter</i> spp., <i>Proteus</i> spp., <i>Enterobacter</i> spp., and <i>Serratia marcescens</i>, and <i>Yersinia</i> spp.)</p>	<p>Chapter 19: <i>Enterobacteriaceae</i>.</p>
<p>Week 4 2/5/2024</p>	<p>Lecture 4</p>	<p>Gram-Negative Bacilli and Coccobacilli (Non-Enterobacteriaceae)</p> <p>(MacConkey-Positive, Oxidase-Positive Gram-Negative Bacilli and Coccobacilli: <i>Pseudomonas</i> spp., <i>Burkholderia</i> spp. <i>Vibrio</i> spp., <i>Aeromonas</i> spp., <i>Plesiomonas shigelloides</i>, <i>Chromobacterium violaceum</i>, <i>Eikenella corrodens</i>, <i>Pasteurella</i> spp., <i>Actinobacillus</i> spp., <i>Kingella</i> spp., <i>Cardiobacterium hominis</i> and <i>Capnocytophaga</i> spp)</p>	<p>Chapter 21: <i>Pseudomonas</i>, <i>Burkholderia</i>, and Similar Organisms.</p> <p>Chapter 25: <i>Vibrio</i>, <i>Aeromonas</i>, <i>Plesiomonas shigelloides</i>, and <i>Chromobacterium violaceum</i>.</p> <p>Chapter 28: <i>Eikenella corrodens</i> and Similar Organisms.</p> <p>Chapter 29: <i>Pasteurella</i> and Similar Organisms.</p> <p>Chapter 30: <i>Actinobacillus</i>, <i>Kingella</i>, <i>Cardiobacterium</i>, <i>Capnocytophaga</i>, and Similar Organisms.</p>
<p>Week 5 2/12/2024</p>	<p>Lecture 5</p>	<p><i>Haemophilus</i> spp.</p> <p>(<i>H. influenza</i>, <i>H. parainfluenzae</i> and <i>H. ducreyi</i>)</p>	<p>Chapter 31: <i>Haemophilus</i>.</p>
	<p>Lecture 6</p>	<p>Gram-Negative Bacilli that are Optimally Recovered on Special Media</p> <p>(<i>Campylobacter</i> spp., <i>Helicobacter</i> spp., <i>Legionella</i> spp., <i>Francisella</i> spp., <i>Brucella</i> spp., and <i>Bordetella</i> spp.)</p>	<p>Chapter 33: <i>Campylobacter</i>, <i>Arcobacter</i>, and <i>Helicobacter</i></p> <p>Chapter 34: <i>Legionella</i></p> <p>Chapter 37: <i>Francisella</i></p> <p>Chapter 35: <i>Brucella</i></p> <p>Chapter 36: <i>Bordetella pertussis</i> and <i>Bordetella parapertussis</i></p>

Week 6 2/19/2024	Lecture 7	Bacteria Not Characterized by Gram Stain: <i>Mycobacteria spp.</i>	Chapter 42: <i>Mycobacteria</i>
Week 7 2/26/2024	Lectures 8	Bacteria Not Characterized by Gram Stain Obligate Intracellular and Nonculturable Bacterial Agents (<i>Chlamydia spp.</i> and <i>Rickettsia spp.</i>), <i>Spirochetes (Treponema spp., Borrelia spp. and Leptospira spp.)</i> , and Cell Wall-Deficient Bacteria (<i>Mycoplasma spp. and Ureaplasma spp.</i>)	Chapter 43: Obligate Intracellular and Nonculturable Bacterial Agents Chapter 45: The Spirochetes Chapter 44: Cell Wall-Deficient Bacteria: <i>Mycoplasma</i> and <i>Ureaplasma</i>
2/29/2024	Quiz I (Lectures 1-7)		
Week 8 3/4/2024	Lecture 9	Anaerobic Bacteria (<i>Clostridium spp.</i> and <i>Bacteroides spp.</i>)	Section 13: Anaerobic Bacteriology Chapter 40: Overview and General Considerations Section 13: Anaerobic Bacteriology Chapter 41: Laboratory Considerations
Week 9 3/11/2024	Lecture 10	Advanced Topics in Antimicrobial Resistance (Bacterial Resistance e.g. ESBL, MRSA, CRE, VRE, mechanisms of D test, Imipenem Resistance, Hodge Test)	Chapter 10: Principles of Antimicrobial Action & Resistance. Chapter 11: Laboratory Methods and Strategies for Antimicrobial Susceptibility Testing.
Week 10 3/18/2024	Lecture 11	Infections of the Urinary Tract (The most common micro-organisms that colonize the urethra and are considered normal flora, and the most common community-acquired and hospital-acquired urinary tract infections.)	Chapter 72: Infection of the Urinary Tract
	Lecture 12	Genital Tract Infections (The normal flora of male and female reproductive systems and the microorganisms that are commonly associated with the genital tract infections)	Chapter 73: Genital Tract Infections

Week 11* 3/25/2024	Lecture 13	Gastrointestinal Tract Infections (The differentiation between the normal flora and the pathogenic organisms distributed throughout the gastrointestinal tract and the infections of the upper and lower tract based on clinical manifestations)	Chapter 74: Gastrointestinal Tract Infections
Week 12 4/1/2024	Lecture 14	Infections of the Upper Respiratory Tract (The most common etiologic agents responsible for upper respiratory tract infections including otitis infections)	Chapter 69: Upper Respiratory Tract Infections and Other Infections of the Oral Cavity and Neck Chapter 71: Infections of the Eyes, Ears, and Sinuses
	Lecture 15	Infections of the Lower Respiratory Tract (The most common etiologic agents responsible for lower respiratory tract infections)	Chapter 68: Infections of the Lower Respiratory Tract
Week 13 4/8/2024	Quiz II (Lectures 8-15)		
Week 14 4/15/2024	Lecture 16	Infections of the Central Nervous System (The most common etiologic agents responsible for causing meningitis)	Chapter 70: Meningitis and Other Infections of the Central Nervous Systems
Week 14 4/22/2024	Lecture 17	Bloodstream Infections (The most common etiologic agents responsible for causing bloodstream infections, bacteremia, and septicemia)	Chapter 67: Bloodstream Infections
	Lecture 18	Miscellaneous Body Infections (The most common bacterial agents correlated with infections of body fluids, bones, bone marrows, solid tissues, eye, skin, soft tissue, and wounds)	Chapter 71: Infections of the Eyes, Ears, and Sinuses Chapter 75: Skin, Soft Tissue, and Wound Infections Chapter 76: Normally Sterile Body Fluids, Bone and Bone Marrow, and Solid Tissues
TBA	Final Exam (TBD)		

*The sessions of March 25, 2024 and March 29, 2024 will be given on March 28 and April 4, 2024, respectively.

Course Requirements

- **Attendance:** Attendance will be taken during each session. Students 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 are subject to withdrawing from the course with a W-grade (AUB catalogue).**
- **Examination:** Students must take the quizzes, unknowns and final exams on the set date. Make-up exams will be given only in case of emergencies or major illness. Only authorized medical reports will be accepted.
- **Dress Code:** Students will be expected to follow a dress code at the laboratory that follows the safety measures.
- **Academic Integrity:** Cheating and plagiarism will not be tolerated. Review the student Code of Conduct in the student 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.
- **Students with Disabilities:** AUB strives to make learning experiences accessible for all. If you anticipate or experience academic barriers due to a disability (including learning difficulties, mental health, chronic or temporary medical conditions), please inform the instructor immediately or kindly register with the Accessible Education Office (AEO) (accessibility@aub.edu.lb; +961-1-350000, x3246; West Hall, 314') in order to ensure that you receive the support you need and to facilitate a smooth accommodation process.
- **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 Tauk 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.